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Vol. 1056 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

July 30, 1985

U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 30, 1985 Volume 1056 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

May 7, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 27, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,340,976 through 4,342,120

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of June 1985

Affirmed	152
Affirmed in Part	19
Reversed	80
Total	251

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,907,808, Re. S.N. 741,393, Filed June 3, 1985, Cl. 546/156, 1,4-DIHYDRO-4-OXO-7-3-QUINOLINE-

CARBOXYLIC ACID DERIVATIVES, George Y. Lesher, et al., Owner of Record: *Sterling Drug, Inc., New York, N.Y.*, Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 122

4,192,625, Re. S.N. 744,429, Filed June 13, 1985, Cl. 404/005, PRECAST CONCRETE CATCH BASIN WITH FORM FOR GUTTER INLET, Harold Peletz, Owner of Record: *Santa Rosa Cast Products Co., Santa Rosa, Calif.*, Attorney or Agent: Ernest M. Anderson, Ex. Gp.: 356

4,387,724, Re. S.N. 744,636, Filed June 14, 1985, Cl. 128/736, METHOD FOR REMOTELY MONITORING THE LONG TERM DEEP BODY TEMPERATURE IN FEMALE MAMMALS, David L. Zartman, Owner of Record: *New Mexico State University Foundation, Inc., Las Cruces, N. Mex.*, Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 335

4,388,702, Re. S.N. 744,504, Filed June 13, 1985, Cl. 365/104, MULTI-BIT READ ONLY MEMORY CIRCUIT, Douglas P. Sheppard, Owner of Record: *Mostek Corp., Carrolton, Tex.*, Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 235

4,388,708, Re. S.N. 744,621, Filed June 14, 1985, Cl. 367/002, METHOD AND APPARATUS FOR DETERMINING PHYSICAL QUANTITIES, Damir M. J. Skrgatic, et al., Owner of Record: *Inventor,* Attorney or Agent: Robert B. Murray, et al., Ex. Gp.: 222

4,455,255, Re. S.N. 745,773, Filed June 17, 1985, Cl. 252/008, CYANOHYDROCARBYLATED ALKOXYLATES AND GLYCERIDES, Paul R. Stapp, Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.*, Attorney or Agent: Howard D. Doescher, et al., Ex. Gp.: 223

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publicatons This Issue

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Advance Glove Manufacturing Co., Detroit, Mich., Reg. No. 854,209, for the mark "GLASS GRIPPER", Canc. No. 14,495.

Romarc Cosmetics, Ltd., Woodland Hills, Calif., Reg. No. 1,202,466, for the mark "AMBIAGE", Canc. No. 14,499.

Hampshire Designers, Inc., assignee, by mesne assignment, merger and change of name of Coast Empire, Inc., Stamford, Conn., Reg. No. 872,185, for the mark "CHERIE", Canc. No. 14,586.

PK Management Corp., by change of name from Franchise Management Corp., Rochester, N.Y., Reg. 917,388, for the mark "PIZZA KITCHENS", Canc. No. 14,724.

ERMA S. BROWN,
Administrator
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Extensions of Time in Drawing Corrections

Effective July 15, 1985, extensions of time to effect drawing corrections will be granted by the Chief Draftsman where a delay in availability of drawings, or delay in review of drawings was caused by the Office.

July 11, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration

Status of PTO Services

The following is an update of the status of PTO services for June 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	15	Reduced by 10 days since last month.
Trademarks	30	27	Reduced 7 days since last month.
Patent/Trademark Copies:			
Special Window Coupons	1*	99% within 1 day	
Window Coupons	5	97% within 5 days	
Mail Coupons	29 (26)*	99% within 26 days**	
Letter Orders	34 (26)*	99% within 26 days**	
Date of oldest unfilled order		June 21, 1985	
Current Mail Date being processed		June 28, 1985	
Certified Copies:			
Trademark Registrations	30	27	
Applications-As-Filed	20 (10)*	99% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	22	
Filing Reg. Certificates	3 (Issue Date)*	On schedule	
Assignments:			
Patents	25 (20)*	17	
Trademarks	25 (20)*	17	
Avg. Days from Issue Fee Payment to Issue Date	90–100	87	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Patent Grants Mailed	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	3 days late	Delay to account for all withdrawals.
Patent Copies Available	Issue Date	98% on Issue Date	
Trademark Copies Available	Issue Date	97% on Issue Date	

*Reflects new goal for faster service.
**Figures include postal processing and delivery time.

IMPROVEMENTS TO SERVICE

- *Goals for Faster Service* — One of our special service objectives for this year was to commit to goals for faster service. As you will note on the report above, seven goals have been reduced. We will continue to look for ways to expedite services, as well as improve quality.
- *Increased Accessibility of U.S. Patent File* — U.S patent film has been moved from the Assignment Search Room area to the Patent Public Search Room — north stack area. Whereas this film previously was not accessible to the public after 4:45 p.m., it now can be used until 8:00 p.m.
- *Extended Hours for Availability of File Histories* — The File Information Unit extended the hours that files can be made available to requesters from 5:00 p.m. to 7:30 p.m. Past policy required that no files would be issued after 5:00 p.m. due to staffing limitations. To resolve that situation and provide improved service, functions normally performed from 5:00 p.m. until 8:00 p.m. have been deferred to the following morning.
- *New Photocopiers* — All public-use copiers were replaced by new machines.
- *Improvements in Security* — In response to recommendations made by the Department of Commerce Inspector General's Office and in our recognition of opportunities to improve security within the PTO, we are taking further actions to tighten security. Recently, we revised our procedures to preclude removal of any files from the Public Search Room by the public. Also, a roving guard now circulates throughout Crystal Plaza Buildings 3

and 4, as well as the Public Search Room, to enhance protection of people, files, and government property and to ensure that all individuals have a valid building pass displayed. Guards will also be periodically inspecting briefcases, bags, etc. of members of the public and PTO employees to ensure files or government property are not being taken from the authorized premises. The PTO is continuing to pursue additional ways to reduce vulnerabilities regarding security.

HELPFUL HINTS

- *Petitions to Revive Abandoned Applications* — Frequently, a petition to revive an abandoned application is accompanied by an unnecessary request and fee for extension of time. Our policy is set forth in MPEP 711.03(c). Specifically, a response does not require a request and fee for extension of time as a condition of revival.
  Further, a petition to revive an abandoned application is often accompanied by an unnecessary terminal disclaimer. A terminal disclaimer is required only when a grantable petition based on unavoidable delay is not filed within six months of the date of abandonment; cf. 37 CFR 1.137(a) and 1.137(c). A terminal disclaimer should not accompany a petition based on unintentional abandonment; i.e., 37 CFR 1.137(b). In these respects, the reasoning is analogous to petitions to accept late payment of the issue fee under 37 CFR 1.155 or 1.316.
  Finally, when a terminal disclaimer is a necessary component of the petition, the period to be disclaimed must equal the number of months between the date of abandonment and the date a grantable petition is filed. The date of abandonment is the date the period for response has expired; see MPEP 711.04(a). This is normally the end of the three month shortened statutory period. Moreover, the terminal disclaimer should employ the following format:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
(NAME)
Serial No.
Filed:
For:

TERMINAL DISCLAIMER

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Your petitioner, _____, residing at _____

_____;

represents that he is the owner of the entire interest in the above-identified application (by virtue of an assignment recorded at Reel _____ and Frame _____, filed on the _____ day of _____, 19____).

Your petitioner, _____, hereby disclaims the terminal _____ months of any patent granted on the above-identified application or on any application which is entitled to the benefit of the filing date of this application under 35 U.S.C. 120. This agreement is to run with any patent so granted and to be binding upon the grantee, its successors or assigns.

IN WITNESS WHEREOF, I hereunto set my hand and seal this _____ day of _____, 19____.

_____
(Signature)

July 9, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of July 30, 1985

Re. 31,822	4,471,443	4,488,048	4,500,192
Re. 31,848	4,471,524	4,488,156	4,500,210
D. 276,999	4,472,465	4,488,358	4,500,667
4,035,662	4,473,976	4,488,950	4,500,975
4,087,651	4,474,181	4,489,129	4,501,030
4,314,453	4,474,371	4,489,354	4,501,728
4,353,112	4,474,629	4,489,425	4,501,970
4,377,353	4,475,104	4,489,454	4,502,074
4,380,665	4,475,351	4,489,503	4,502,150
4,382,854	4,475,719	4,489,802	4,502,271
4,383,613	4,476,106	4,490,216	4,502,436
4,402,461	4,476,250	4,490,331	4,502,610
4,402,525	4,476,330	4,490,342	4,502,705
4,416,108	4,476,426	4,490,556	4,502,888
4,418,219	4,476,463	4,490,728	4,502,967
4,419,084	4,476,855	4,490,781	4,502,986
4,422,951	4,476,878	4,490,989	4,503,022
4,428,137	4,476,994	4,491,183	4,503,448
4,430,268	4,477,069	4,491,654	4,503,838
4,433,190	4,477,311	4,491,673	4,503,958
4,434,491	4,477,496	4,492,376	4,504,249
4,434,891	4,477,584	4,493,512	4,504,339
4,438,012	4,477,649	4,493,787	4,504,378
4,438,274	4,477,897	4,494,111	4,504,647
4,438,277	4,478,230	4,494,127	4,504,657
4,443,913	4,478,370	4,494,363	4,504,893
4,449,505	4,478,614	4,494,965	4,505,321
4,453,920	4,479,002	4,495,219	4,505,727
4,454,049	4,480,117	4,495,363	4,505,962
4,455,761	4,480,704	4,495,519	4,506,138
4,457,790	4,481,391	4,496,624	4,507,507
4,459,591	4,481,860	4,496,662	4,508,256
4,460,669	4,482,337	4,496,886	4,508,641
4,461,097	4,482,752	4,497,997	4,508,841
4,461,681	4,483,623	4,498,245	4,510,293
4,462,497	4,484,439	4,498,335	4,510,621
4,463,064	4,484,655	4,498,523	4,511,178
4,463,901	4,485,423	4,498,778	4,511,233
4,466,916	4,485,784	4,499,142	4,511,274
4,467,354	4,485,868	4,499,151	4,511,642
4,467,722	4,486,058	4,499,339	4,511,646
4,469,255	4,486,341	4,499,559	4,520,038
4,469,669	4,487,125	4,499,676	4,520,445
4,470,504	4,487,173	4,500,073	
4,470,822	4,487,934	4,500,142	

Disclaimers

4,243,779.—*Roy E. McAlister,* Phoenix, Ariz. POLYCARBONATES STABILIZED BY HALOHYDROCARBON, HALOCARBON OR SILANE GROUPS. Patent dated Jan. 6, 1981. Disclaimer filed Feb. 4, 1983, by the inventor, *Roy E. McAlister.*

Hereby enters this disclaimer to claims 1, 3–10, and 38 of said patent.

4,437,429.—*Joel Goldstein,* Ambler, Pa. and *Albert Abrevaya,* Chalfont, Pa. ANIMAL LITTER. Patent dated Mar. 20, 1984. Disclaimer filed May 22, 1985, by the assignee, *Aquarium Pharmaceuticals, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,456,888.—*Yalcin Ayasli,* Lexington, Mass. RADIO FREQUENCY NETWORK HAVING PLURAL ELECTRICALLY INTERCONNECTED FIELD EFFECT TRANSISTOR CELLS. Patent dated June 26, 1984. Disclaimer filed Dec. 7, 1984, by the assignee, *Raytheon Co.*

Hereby enters this disclaimer to claims 17–22 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 22, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-20-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-14-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	8-03-83

Expiration of patents: The patents within the range of numbers indicated below expire during June 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,386,103 to 3,390,404, inclusive

Plant Patents ..... Numbers 2,814 to 2,816 inclusive

REISSUES

JULY 30, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,955

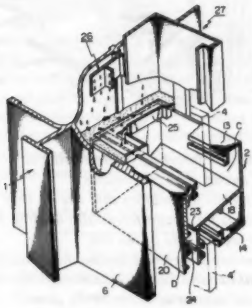
FLASHING CONSTRUCTION FOR A CURTAIN WALL

Yoshinobu Shiga; Ryusuke Kage, and Masakatsu Iwata, all of Tokyo, Japan, assignors to Nippon Light Metal Company, Limited, Tokyo, Japan

Original No. 4,276,729, dated Jul. 7, 1981, Ser. No. 65,285, Aug. 9, 1979. Application for reissue Jul. 5, 1983, Ser. No. 510,980

Int. Cl.[3] E06B 7/14

U.S. Cl. 52—209 12 Claims



1. A flashing construction for a curtain wall having a plurality of vertical mullions disposed parallel to each other at a predetermined distance and panels being mounted between adjacent mullions, said flashing construction comprising:

a vertical mullion *having interior and exterior flanges, said mullion being* provided with a mounting groove at each side thereof for receiving [one] *the* side portion [on] *of* the panel;

[an enclosed vertical space formed between said mounting groove and the side portion of the panel, said vertical space being extended in the longitudinal direction of the mullion, and said vertical space being connected to the open air outside the mullion;]

[an extra] bead *means* for the mullion [, said extra bead being] disposed [in said mounting groove at the outermost position therein,] *between said interior and exterior flanges* so as to form a narrower mounting groove therebetween for receiving [another] *the* side portion of the panel, *said bead means including an exterior bead;*

an enclosed vertical space formed between said exterior flange and said exterior bead, said vertical space being extended in the longitudinal direction of the mullion, and said vertical space being connected to the open air outside the mullion; and

another enclosed vertical [spaced] *space* formed between said narrower groove and the [other] side portion of the panel, said other vertical space being extended in the longitudinal direction of the mullion, and said [extra] *means* being provided with intake ports, whereby said other vertical space is connected to the open air outside the mullion.

Re. 31,956

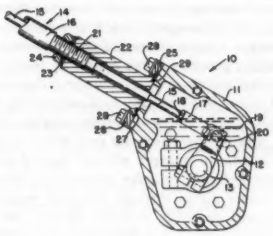
INFINITELY ADJUSTABLE CABLE CONTROLLED APPARATUS AND METHOD

James R. Deck, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,034,622, dated Jul. 12, 1977, Ser. No. 697,300, Jun. 17, 1976. Application for reissue May 10, 1983, Ser. No. 493,428

Int. Cl.[3] F16C 1/16

U.S. Cl. 74—501 R 13 Claims



1. An infinitely adjustable cable-controlled apparatus comprising

a support member,

a control member movably mounted on said support member,

push-pull cable means connected to said control member for selectively moving the same,

a bracket mounted on said support member and mounting said cable means thereon,

adjustment means adjustably mounting said cable means on said bracket for axial movement thereon to selectively move and adjust the position of said control member relative to said support member upon rotation of said bracket, and

retaining means, *separate from said bracket and releasably attached to said support member by releasable fastening means,* mounting said bracket on said support member and for selectively permitting rotation of said bracket relative to said support member upon [adjustment of said control member] only partial release of said fastening means.

Re. 31,957

PNEUMATIC-HYDRAULIC TOOL, PREFERABLY FOR BLIND RIVETING

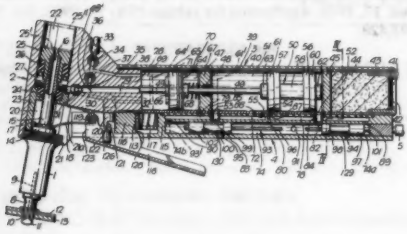
Lars E. G. Olsson, Kyrkogatan 61 A, S-671 03 Arvika, Sweden

Original No. 4,310,056, dated Jan. 12, 1982, Ser. No. 109,978, Jan. 7, 1980. Application for reissue Mar. 15, 1983, Ser. No. 475,485

Claims priority, application Sweden, Jan. 15, 1979, 7900312

Int. Cl.³ B23B *45/04*

U.S. Cl. 173—169 **15 Claims**



11. A pneumatic-hydraulic tool comprising a hydraulic cylinder containing hydraulic fluid, a hydraulic working piston movable in a series of steps in said hydraulic cylinder, a gripping member connected to said working piston and movable thereby, an air cylinder, a pneumatic power piston cyclically movable in said air cylinder, a plunger means connected to the power piston for providing a working pressure to the hydraulic fluid, a hydraulic fluid reservoir, feed means in said reservoir for maintaining the hydraulic fluid under feed pressure, said tool having a head and an elongated grip handle, said power piston, said air cylinder, said plunger means, said reservoir and said feed means located in said elongated grip handle, a plunger passage located between said reservoir and said hydraulic cylinder, said plunger means extending from said power piston through the feed means into said plunger passage and cyclically movable therein, said hydraulic working piston moving one step in said hydraulic cylinder on each cyclic stroke of said power piston and said plunger, said feed means filling said plunger passage with an amount of hydraulic fluid corresponding to the amount fed into the hydraulic cylinder by the preceding plunger stroke from said reservoir upon each stroke of the plunger when the plunger moves away from the hydraulic cylinder.

12. Tool as claimed in claim 11, wherein the plunger passage terminates at one end in the hydraulic cylinder, and a valve means is located between the plunger and the hydraulic cylinder for preventing the hydraulic fluid from retreating in the plunger passage from the hydraulic cylinder during the stroke of the plunger when the plunger moves away from the hydraulic cylinder.

Re. 31,958

APPARATUS FOR TURNING TIRES INSIDE OUT

Merlyn R. Hilt, St. Francis, Kans., assignor to Hilt Tire Feedbunk, Inc., St. Francis, Kans.

Original No. 4,278,413, dated Jul. 14, 1981, Ser. No. 76,970, Sep. 20, 1979. Application for reissue May 31, 1983, Ser. No. 499,269

Int. Cl.³ B29C *17/00, 21/00*

U.S. Cl. 425—383 **15 Claims**

1. Apparatus for inverting a tire having a first side and an axially spaced second side, comprising:

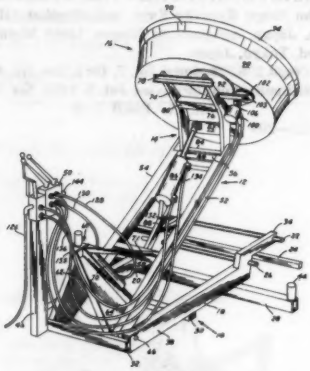
tire holding means for holding said tire on said first side;

grappling means for circumferentially holding an edge of the second side of the tire relative to movement of said tire on said tire holding means, said grappling means being fixed relative to the tire [molding] *holding* means;

first tire moving means for moving said tire, on said tire holding means, in a first direction relative to said grappling means to axially displace a first edge portion;

second tire moving means for moving said tire, on said tire holding means, in a second direction relative to said grappling means to axially displace a second edge portion;

said first edge portion and said second edge portion together constituting the entire edge, whereby the edge is axially displaced relative to the first side to invert the tire.



15. Apparatus for inverting a tire having a first side and an axially spaced second side, comprising:

tire holding means for holding said tire on said first side;

grappling means for circumferentially holding a cut edge portion of the second side of the tire;

means for moving either said tire holding means or said grappling means to move the first side through the cut edge portion of the second side so as to invert the tire.

Re. 31,959

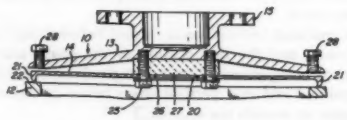
SEALING MEANS FOR A COKE OVEN CHUCK DOOR

Calvin E. Kelly, Murrysville, and Richard W. Stanley, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Original No. 4,216,062, dated Aug. 5, 1980, Ser. No. 8,992, Feb. 5, 1979. Application for reissue Apr. 15, 1981, Ser. No. 254,250

Int. Cl.³ C10B *25/06, 25/16*

U.S. Cl. 202—248 **2 Claims**



7. In a chuck door, said door including a frame and a substantially rectangular sealing member having a planar surface, said member also having a peripheral flange for mating with and extending inwardly toward a sealing surface for said door, the outward face of said member being mounted to said frame, the improvement in said chuck door which comprises:

said member being mounted to said frame to provide an intentional clearance for flexural movement of the sealing member flange both inwardly and outwardly,

said sealing member having a substantial opening in the center thereof,

first and second plates, centrally mounted on opposite sides of the planar surface of the sealing member,

said plates extending congruently around the opening in the sealing member and being joined thereto,

at least one of said plates closing said opening in the sealing member, the peripheral edges of said plates having an arcuate

shape to provide uniform cantilever support along a continuous line for the arm formed by the planar surface of the sealing member, the length of said arm being significantly greater than said intentional clearance,

whereby, said sealing member has improved flexibility, providing automatic alignment of the flange thereof with the sealing surface for said chuck door.

Re. 31,960

COMPOSITES AND METHODS FOR PROVIDING METAL CLAD ARTICLES AND ARTICLES PRODUCED

Cecil L. Phillips, Boughton, England, assignor to Scott Bader Company Limited, Great Britain

Original No. 4,421,827, dated Dec. 20, 1983, Ser. No. 340,405, Jan. 18, 1982. Application for reissue Oct. 5, 1984, Ser. No. 658,337

Claims priority, application United Kingdom, Jan. 21, 1981, 8101796; Jan. 21, 1981, 8101797; Jun. 19, 1981, 8118988; Oct. 6, 1981, 8130121

Int. Cl.[3] **B29D** *9/08;* **B29H** *9/00;* **B32B** *15/08*

U.S. Cl. 428—418 **16 Claims**

1. A composite for providing a rigid metal clad article of thermosetting resin which composite includes a metal facing, a layer of adhesive material on the metal facing and, laid on the layer of adhesive material, an uncured curable thermosetting resin, the layer of adhesive material consisting essentially of a fully precured thermosetting or a thermoplastics material and being capable of adhesion to the metal facing and to the thermosetting resin at least upon curing of said uncured resin to form an adhesive bond with both the metal facing and the cured curable thermosetting resin.

Re. 31,961

HIGH SOLIDS PIGMENT COATING COMPOSITION

Roelof Buter, Dieren, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Original No. 4,104,240, dated Aug. 1, 1978, Ser. No. 749,698, Dec. 10, 1976. Application for reissue May 6, 1983, Ser. No. 492,266

Claims priority, application Netherlands, Dec. 15, 1975, 7514566

Int. Cl.[3] **C08L** *67/02*

U.S. Cl. 524—539 **18 Claims**

1. A high solids pigmented coating composition prepared from a blend of an ester diol as binder and a curing agent for the binder, characterized in that (1) the ester diol is a mixture of

(a) 20–80 mole % of an ester diol having the general formula:

$$H[O-R_2-O-\overset{O}{\overset{\|}{C}}-R_1-\overset{O}{\overset{\|}{C}}]_m-O-R_3-OH,$$

where R_1 represents the group formed by abstraction of the carboxyl groups from a cycloaliphatic and/or aromatic dicarboxylic acid having 8 to 20 carbon atoms and R_2 and R_3 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to [12] 6 carbon atoms, and m is a number of 1–3, and

(b) 80–20 mole % of an ester diol having the general formula:

$$H[O-R_5-O-\overset{O}{\overset{\|}{C}}-R_4-\overset{O}{\overset{\|}{C}}]_n-O-R_6-OH,$$

where R_4 represents the group formed by abstraction of the two carboxyl groups from an aliphatic dicarboxylic acid having 2 to 12 carbon atoms, and R_5 and R_6 may be the same or different and represent groups formed by abstraction of the two hydroxyl groups from a divalent alcohol having 2 to [12] 6 carbon atoms, and n is a number of 1–3,

(2) the curing agent for the binder is an aminoplast, and

(3) the amount of pigment in said coating composition is at least 30% by weight, based on the total solids content.

Re. 31,962

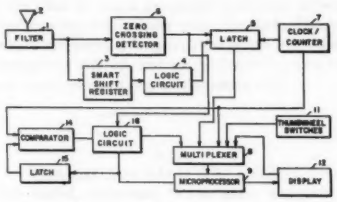
LORAN-C NAVIGATION APPARATUS

Lester R. Brodeur, Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Original No. 4,318,105, dated Mar. 2, 1982, Ser. No. 22,661, Mar. 22, 1979. Continuation of Ser. No. 842,706, Oct. 17, 1977, abandoned. Application for reissue Jan. 5, 1984, Ser. No. 568,557

Int. Cl.[3] **G01S** *1/24*

U.S. Cl. 343—389 **39 Claims**



18. A navigation receiver-indicator providing navigation information by receiving and measuring differences in the time of arrival of coded radio signals received from a plurality of navigation transmitters, in groups of transmitters, each of said coded radio signals comprising a train of discrete radio frequency pulses having a known pulse repetition rate, the transmission of said pulse trains from each of said navigation transmitters in a given group being repeated at a known group repetition interval, said receiver-indicator comprising:

means for selecting a group of transmitters to be used for said time difference of arrival measurements,

first logic means processing said radio signals as they are received for determining when received signals are properly coded indicating they are from said navigation transmitters, said first logic means comprising

shifter register means,

means for continuously shifting radio signals as they are received through said shift register means,

said shift register means having a sufficient length to contain a window time sample of duration at least as long as that of one of said pulse trains from one of said navigation transmitters,

said shift register means further including a set of output terminals spaced apart by the known pulse repetition rate of the pulses in said pulse trains from said navigation transmitters, and

decoding means connected to said output terminals and providing an output indication whenever the signals contained in said shift register means correspond to said coded radio signals from one of said navigation transmitters,

processor means storing and analyzing said output indications from said first logic means to determine when received radio signals are from transmitters of a group of transmitters selected using said selecting means, and

second logic means enabled by and functioning with said processor means after said processor means has determined that received radio signals are from said selected group of transmitters to calculate the time of reception of subsequently received radio signals and then to analyze said last-mentioned radio signals to thereby locate a specific point of said last-mentioned radio signals used by said processor means to accurately measure the difference in time of arrival of said radio signals from individual transmitters of said selected group of transmitters and provide a visual output of said measurements to provide navigation information.

PLANT PATENTS

GRANTED JULY 30, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,522

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Dec. 19, 1983, Ser. No. 563,276
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its single petaled blooms which range in color from Persimmon Orange with a bright Buttercup Yellow base when newly opened to varying shades of Marigold Orange, Dutch Vermilion, and finally Blood Red as the bloom matures; further characterized by an extremely vigorous growth habit, easy to propagate from cuttings, with flowers borne singly and in sprays of 3 to 5 or more.

5,523

MINIATURE ROSE PLANT NAMED BLOOMER GIRL

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Dec. 19, 1983, Ser. No. 563,297
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'Bloomer Girl' of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its abundance of coral pink blooms, usually borne singly or in sprays of 3 to 5 or more, and its vigorous growth habit. The plant may be propagated from cuttings, and it grows well outdoors or in the green house.

5,524

SOPHORA JAPONICA PRINCETON UPRIGHT

William Flemer, III, Princeton, N.J., assignor to Treesearch, Kingston, N.J.

Filed Dec. 7, 1983, Ser. No. 558,846
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of *Sophora japonica* tree, as herein shown and described, characterized particularly as to novelty by the unique combination of more narrow, upright head of branches having a generally rectilinear crown in outline, resistance to cold winter twig die-back, freedom from stem cankers caused by a fungus of the genus Fusarium though lightly to heavily injured, and sparse flowering and fruiting as compared with standard *Sophora japonica* trees.

5,525

CARNATION NAMED STANGELLA

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. van Staaveren, both of Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,614
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of miniature carnation, substantially as herein shown and described, characterized by its continuous production of blooms and its rapid growth rate, the larger number of blooms per flowering stem than is normal for miniature carnations, and its apparent resistance to *Fusarium oxysporum.*

5,526

CARNATION NAMED STANOKER

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij and M. C. van Staaveren, both of Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,683
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its continuous year round production of deep yellow blooms of relatively large size, and by the stability of the flower color which holds throughout all seasons.

PATENTS

GRANTED JUL. 30, 1985

ERRATA

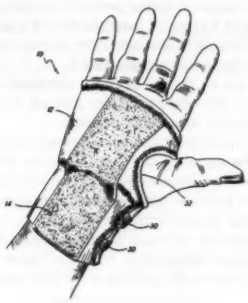
For CLASS	See PATENT NO.
523–022	4,531,243
623–008	4,531,244
446–066	4,531,323
556–139	4,532,080
514–772	4,532,132
514–725	4,532,133
514–055	4,532,134
514–222	4,532,135
514–277	4,532,136
514–371	4,532,137
514–369	4,532,138
514–627	4,532,139
423–013	4,532,140
514–543	4,532,343
369–044	4,532,616

PATENTS

GRANTED JULY 30, 1985

GENERAL AND MECHANICAL

4,531,241
HAND GLOVE
Saul H. Berger, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Oct. 3, 1984, Ser. No. 657,573
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **6 Claims**



1. A hand glove comprising:

a flexible and elastic body adapted to terminate below the fingers, and to wrap around the palm, the wrist, and a portion of the forearm of a wearer, the body having opposite first and second transverse edges, the first transverse edge having a curved portion forming an opening to receive the thumb of the wearer;

a durable and flexible outside pad secured to an outside surface of the body adjacent the first transverse edge thereof, and adapted to terminate below the fingers and inside the thumb of the wearer and to fit over a major portion of the palm, the wrist, and a portion of the forearm of the wearer to protect the glove body and to cushion the palm and the wrist without restricting flexing of the wrist, thumb, and fingers;

a flexible and resilient cushion secured to an inside surface of the body adjacent the first transverse edge thereof, and adapted to terminate below the fingers and inside the thumb and to fit over a major portion of the palm, the wrist, and a portion of the forearm to further cushion the palm and the wrist without restricting flexing of the wrist, thumb, and fingers; and

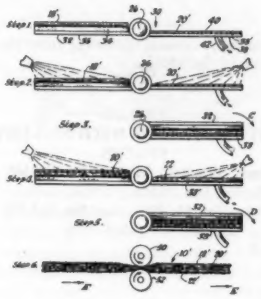
releasable fastening means to attach the first and second transverse edges of the glove body together on the hand and arm of the wearer, and including

(i) attachment means connected to the outside surface of the body adjacent the second transverse edge thereof,

(ii) a top flap connected to the first transverse edge of the body and adapted to extend therefrom, above the thumb, and into engagement with the attachment means to connect the transverse edges of the body together, and

(iii) at least one lower flap connected to the first transverse edge of the body and adapted to extend therefrom, below the thumb, and into engagement with the attachment means to connect the transverse edges of the body further together.

4,531,242
ELASTIC BODYBAND METHOD AND APPARATUS
Norman D. Levine, 2205 NW. 30th Pl., Pompano Beach, Fla. 33060
Continuation-in-part of Ser. No. 183,195, Sep. 20, 1980, abandoned. This application Mar. 10, 1983, Ser. No. 474,088
Int. Cl.³ A41H *1/00*
U.S. Cl. 2—243 R **9 Claims**



1. A method of manufacturing an improved bodyband composite having a first layer of terrycloth having smooth and coarse sides, an intermediate layer of neoprene, and a second layer of terrycloth having a smooth side, said method comprising the steps of:

A. applying at least one layer of adhesive onto one side of said intermediate neoprene layer;

A.(1) applying at least one layer of adhesive onto the smooth side of said first layer of terrycloth;

A(1)(a). spraying at least a light coat of adhesive onto a working surface of a working member;

A(1)(b). pressing and bonding said working surface and said coarse side of said first layer of terrycloth to lift and hold said first layer of terrycloth;

B. pressing and bonding the smooth side of said first layer of terrycloth to said one side of said intermediate neoprene layer;

C. applying at least one layer of adhesive onto the other side of said intermediate neoprene layer; and

D. pressing and bonding the smooth side of said second layer of terrycloth to said other side of said intermediate neoprene layer thus forming a three layer piece of fabric of predetermined length.

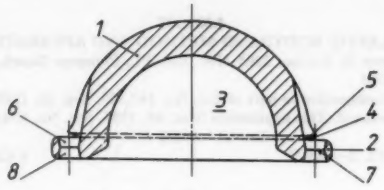
4,531,243
ARTIFICIAL HIP JOINT SOCKET
Bernhard G. Weber, St. Gall, and Otto Frey, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Sep. 20, 1983, Ser. No. 533,960
Claims priority, application Switzerland, Oct. 5, 1982, 5839/82
Int. Cl.³ A61F *1/04, 5/04*
U.S. Cl. 623—22 **2 Claims**

1. A method of implanting an artificial hip joint socket in a prepared pelvis, said method comprising the steps of

forming a hardenable bone cement bed in the prepared pelvis,

implanting a hip joint socket having an outwardly directed peripheral edge with a plurality of constricted bores each of which bores narrows from one side of the edge in a direction towards a free surface of the edge in the bone

cement bed while permitting excess bone cement from the bed to flow into and through the bores, and



removing the bone cement streaming from the bores at the free surface of the edge.

4,531,244

MAMMARY PROSTHESIS WITH MULTIPLE FLOW SPACES

Robert S. Hamas, Woodhill Medical Park, 8345 Walnut Hill, Suite 120, Dallas, Tex. 75231

Filed Jul. 14, 1983, Ser. No. 513,754
Int. Cl.³ A61F *1/00*
U.S. Cl. 623—8 **18 Claims**

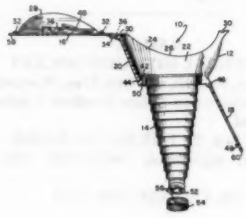
1. A mammary prosthesis comprising a soft envelope of an inert elastomer for containing an inert fluid material, a plurality of rigid protuberances of an inert material distributed over the surface of the envelope, and having distal ends spaced from said surface a sufficient distance so as to space the scar tissue that forms upon implantation from the surface of the envelope providing a flow space therebetween into which the envelope may be displaced to permit the prosthesis to change shape.

4,531,245

PERSONAL URINAL DEVICE

David L. Lowd, 13 Clifton Ave.; Gerald J. Sobolewski, 85 Wheeler Ave.; Lynne R. Lowd, 13 Clifton Ave., and Barbara Sobolewski, 85 Wheeler Ave., all of Salem, N.H. 03079

Filed Mar. 7, 1984, Ser. No. 587,205
Int. Cl.³ A47K *11/00*
U.S. Cl. 4—144.3 **6 Claims**



1. A personal urinal device for use by a female in a standing or sitting position comprising:

a housing forming an elongated bowl member having an upper opening and a lower opening,

said housing tapering downwardly from said upper opening to said lower opening,

said upper opening including an edge having a generally elongated curvature sloping laterally and upwardly anteriorly and posteriorly to duplicate a line extending from the vaginal opening anteriorly and laterally generally coincident with the labia major to a point anterior of the urethra to thereby form a seal with the flesh of said female on placement of said bowl in position for use by said female,

an elongated hollow conductor member adapted at one end to form a fluid tight seal with said lower opening of said bowl member and tapering to a discharge opening at the other end,

said elongated hollow conductor member being sufficiently flexible to be compressed into flattened position within said bowl member prior to use,

upper cover means attached to said bowl adjacent said upper opening and having at least the lower edge in configuration for fluid light seal when in register with said upper opening edge in closed position,

said upper cover means opening forwardly of said bowl member to provide means for manual munipulation and holding of said urinal device, and

lower cover mean attached to said bowl adjacent said lower opening for securing said opening prior to use,

said lower cover means opening rearwardly of said bowl member to provide other means for manual munipulation and holding of said urinal device,

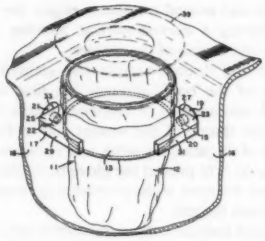
said bowl member and said flexible elongated hollow conductor means cooperating to collect urine from said female and direct said urine to a suitable spot.

4,531,246

REMOVABLE GARBAGE BAG HOLDER FOR KITCHEN SINKS

John J. Earley, P.O. Box 196, Lansdowne, Pa. 19050

Filed Dec. 22, 1983, Ser. No. 564,558
Int. Cl.³ E03C *1/18*
U.S. Cl. 4—629 **3 Claims**



1. A removable garbage bag holder for holding garbage bags open in kitchen sinks without using hands so as to leave the hands free for kitchen chores, comprising

a cylindrical ring adapted to have the top of a garbage bag folded onto it with the main portion of the bag depending therefrom,

a first mounting means for removably attaching the garbage bag holder to a wall of a kitchen sink mounted on the outside of the ring with a first suction cup facing outwardly from the ring,

and a second mounting means for removably attaching the garbage holder to a wall of a sink mounted on the outside of the ring with a second suction cup facing outwardly from the ring,

the first suction cup facing 90° away from the second suction cup so as to attach to adjacent walls in a corner of a sink,

whereby the removable bag holder is adapted to be mounted in a corner of a kitchen sink with the top portion of the ring positioned above the bottom wall of the sink, is adapted to hold a garbage bag at its top with the bottom of

the bag resting on the bottom wall of the sink and is adapted to accommodate bags of various lengths because the removable bag holder may be adjusted to any height in the sink.

4,531,247

ADJUSTABLE UPPER BODY REST

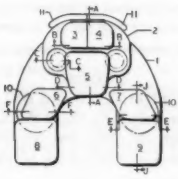
George D. Eary, Sr., 8 N. Woodlawn Ave., LaVale, Md. 21502

Filed Sep. 28, 1982, Ser. No. 425,375

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] A47G *9/00*

U.S. Cl. 5—436 7 Claims



1. An adjustable upper body rest for the head and shoulder portions of the human body in a predetermined position and comprising:

a. a base member,

b. a pair of laterally spaced apart resilient shoulder support members adapted to support the shoulders of said human body in a predetermined position,

c. each of said shoulder support members being so attached to the base to allow adjustments to a large variety of different elevations and with the capability of stabilization at any such elevation as may be desired,

d. a forehead support member having separate movable members comprising at least one element supporting the forehead, configured as a "V+ tilted toward the user's face when the user is in a face down position, and providing support for the human forehead at varying degrees below a horizontal position to the right or left side,

e. said forehead support members being movable closer to or farther from each other in a limited manner and providing means to align with the lower face member elevation-wise as well as in a linear manner,

f. means provided to secure said forehead members in any desired position as well as to allow complete removeability from the base,

g. a lower face rest, rotateable in a limited manner about a horizontal axis perpendicular to said forehead support members,

h. means provided to adjust amount of rotation of the lower face rest about said horizontal axis,

i. means provided to allow said lower face rest and said forehead support member, to be moved on a horizontal plane and simultaneously nearer to or farther from one or both of the said shoulder support members, in a limited manner,

j. means provided to allow rotational movement of said lower face rest and said forehead support members about vertical axis in a limited manner,

k. a lower face rest configured in a concave manner along an axis perpendicular to said forehead support members.

4,531,248

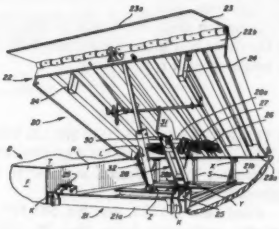
DOCKBOARD ASSEMBLY

Michael A. Swessel, and Norbert Hahn, both of Cudahy, Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Sep. 7, 1982, Ser. No. 415,174

Int. Cl.[3] E01D *1/00*

U.S. Cl. 14—71.3 6 Claims



1. In a dockboard assembly having a ramp means pivotally connected to a substantially stationary support means for movement to selected upwardly pivoted raised positions, the improvement comprising a releasable ramp holding means mounted for adjustment between release and non-release positions, when in the release position, said ramp-holding means enabling the ramp means to pivot upwardly to a selected raised position and, when in a non-release position, said ramp-holding means retaining the ramp means in the selected raised position; a manually actuated first release element operatively connected to said ramp-holding means and adapted, when manually actuated, to effect movement of said ramp-holding means to said release position; and a second release element operatively connected to said ramp-holding means and adapted to automatically effect movement of said ramp-holding means to said release position only when said ramp means has assumed a raised position and an external upwardly pivoting force exceeding a predetermined magnitude is exerted on said raised ramp means; said first and second release elements being operative independently of one another; said release elements being flexible cables and the first release element having a substantially greater length than said second release element.

4,531,249

FLOOR-CARE APPLIANCE

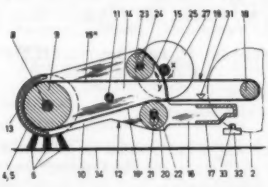
Kurt Sternberg, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,877

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239347

Int. Cl.[3] A47L *11/18*

U.S. Cl. 15—49 C 18 Claims

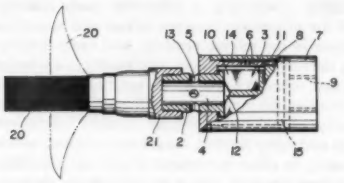


1. A floor-care appliance having brush bodies on a rotary shaft, for automatic adjustment of the position in height of the rotary shaft and the brush bodies during application of the latter in operation, comprising:

a housing,

a motor fixed to said housing,
a drive belt,
a rocker pivotally mounted to said housing,
said rotary shaft being carried by said rocker, and
said drive belt operatively connected between said rotary shaft and said motor to transmit rotational motion therebetween, tension on said drive belt changing as a function of load on said brush bodies during the application of the latter in operation, and
means for swinging said rocker arm in response to the tension of the drive belt for automatically adjusting the position in height of said rotary shaft.

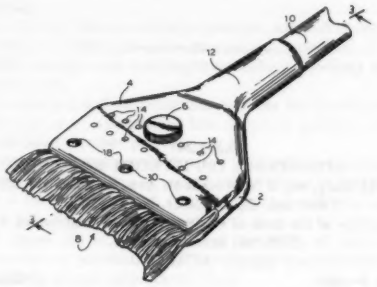
4,531,250
WATER TURBINE AND BRUSH HEAD USING THE WATER TURBINE FOR CLEANING PIPES
Yoshinori Watanabe, Tokyo, Japan, assignor to Kyowa Kikai Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 6, 1983, Ser. No. 501,193
Claims priority, application Japan, Sep. 20, 1982, 57-162298; Oct. 2, 1982, 57-173745
Int. Cl.³ B08B *9/02;* **A46B** *13/06*
U.S. Cl. 15—104.12 **5 Claims**



1. A cleaning brush head comprising a turbine which comprises a rotor having a rotor blade means on one end and brush means on the other end, the improvement in which said rotor is bored at the axial center thereof to provide an exhaust channel at the center thereof for conducting spent propellant from said rotor blade means and is provided with a housing for said rotor blade means comprising an inner casing which has nozzles bored in the circumference thereof for directing propellant onto said rotor blade means, and an outer casing which defines a pressure chamber with said inner casing for supplying pressurized propellant to said nozzles, and means for supplying pressurized propellant to said pressure chamber, said exhaust channel comprising outlet port means formed in the circumference surface of the rotor exterior of said housing adapted to jet spent propellant radially at an angle canted to the normal such as to augment the rotation of the rotor.

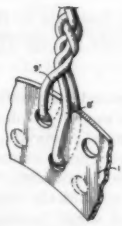
4,531,251
MOP HOLDER
George Pappas, 315 Wynsum Ave., Merrick, N.Y. 11566, and Archimedes M. Perdios, 169 Traymore Blvd., Island Park, N.Y. 11558
Filed Jul. 11, 1983, Ser. No. 512,374
Int. Cl.³ A47L *13/24*
U.S. Cl. 15—147 R **8 Claims**

1. A mop holder comprising;
a base plate;
a cover plate adapted to overlay the base plate, contacting the base plate along the sides thereof and defining an opening therebetween so that the base and cover plates act as a housing;
means for releasably securing the cover plate to the base plate;
a mop head disposed between the plates, provided with a plurality of holes;
a plurality of studs attached to the base plate along a front edge thereof, which extend through the holes in the mop head;
a plurality of apertures located on the cover plate and adapted to receive the studs of the base plate;



a receptacle means attached to the backing plate and adapted to removably receive and secure a handle thereto.

4,531,252
HIGH CAPACITY WIRE BRUSHES
Claude Arnal, 6, Rue Pelleport, 75020 Paris, France
Filed Jun. 20, 1983, Ser. No. 506,369
Int. Cl.³ A46B *7/08, 13/02*
U.S. Cl. 15—179 **8 Claims**



1. In combination, a disc-shape carrier of heat conducting material having at least one series of openings arranged in a circle coaxial with the disc; a number of wire bundles supported on said openings, and extending from one side of the disc to the other side; said disc having another series of openings arranged in another circle coaxial with the disc but of a diameter different from that of the first circle with its openings peripherally displaced with respect to the openings of the first circle; and a number of further wire bundles supported on said further openings, and extending from one side of the disc to the other side and intertwined with the number of wire bundles from said one series of openings so as to form knots, the ends of said knots forming a working surface; so as to present on each side of the disc wire bundles of alternatingly different lengths extending from their corresponding openings in radial direction to a predetermined distance beyond the periphery of the disc.

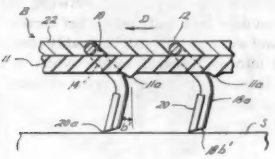
4,531,253
CLEANING DEVICE
Spencer D. Cottam, 11210 Cypress Way Dr., Houston, Tex. 77065
Filed Jul. 14, 1983, Ser. No. 513,695
Int. Cl.³ A47L *13/08*
U.S. Cl. 15—236 C **11 Claims**

1. A cleaning device for use with a drive unit for contacting a surface to be cleaned comprising:

a plurality of bent wires, each wire having a crown portion and a pair of elongated pins extending substantially perpendicular in a downward direction from said crown portion;

a resilient mounting member receiving each of said bent wires with the crown portion on the upper surface of said member and with said elongated pins extending through said resilient mounting member,

said elongated pins having a first portion angularly disposed to the surface plane of said resilient mounting member and substantially within said resilient mounting member and an integrally connected second portion formed at an opposite angle relative to said first portion; and



means cooperating with said mounting member for releasably attaching said device to a drive unit to impart movement to said wires relative to the surface to be cleaned,

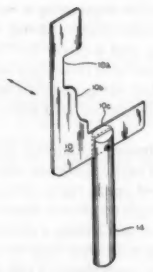
whereby, upon rotation of said device in a predetermined direction, impact between said second portion and said surface to be cleaned is caused, and said resilient mounting member exerts a downward force on said first portion, causing a reaction force to be exerted on each of said crown portions in a direction towards and substantially perpendicular to the upper surface of the resilient mounting member.

4,531,254

SCRAPER FOR GUTTERS

Christian T. Abrahamsen, P.O. Box 2065, Elmwood Park, Ill. 60635

Filed Jul. 18, 1983, Ser. No. 514,528
Int. Cl.³ A47L *25/00*
U.S. Cl. 15—236 R **4 Claims**



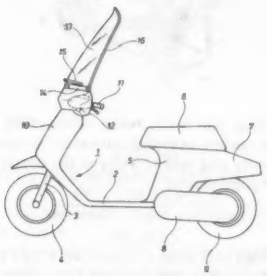
1. A device for scraping the exterior surface of a gutter, said exterior surface having a transverse configuration of (1) a gutter ogee-curve portion, (2) a first gutter straight line extending vertically upwardly from one end of said ogee-curve portion, a second gutter straight line extending vertically downward from the other end of said gutter ogee-curve portion, said device comprising a substantially flat and rigid blade with an edge having a contour including (a) a scraper ogee-curve portion, (b) a first scraper straight line extending from one end of said scraper ogee-curve portion, and (c) a second scraper straight line extending from the other end of said scraper ogee-curve portion and parallel to said first scraper straight line, said contour being substantially congruent with said configuration of said exterior surface.

4,531,255

WINDOW WASHER FOR A LIGHT VEHICLE

Akio Yagasaki, Tokyo, and Masahiko Takenaka, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 426,257, Sep. 29, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 648,342
Claims priority, application Japan, Oct. 22, 1981, 56-157798[U]; Jul. 29, 1982, 57-132699
Int. Cl.³ A47L *1/00*
U.S. Cl. 15—250.01 **11 Claims**



1. A window washer for a motorcycle equipped with a windshield disposed in front of a steering handlebar and a wiper device including a blade for wiping the front surface of the windshield and a wiper motor for driving said blade, comprising:

a washing liquid tank;

conduit means defining a passage for the washing liquid supplied from said washing liquid tank and arranged at least along a part of the periphery of said windshield;

a washing liquid jet nozzle provided at least at one position in said conduit means;

conduit pipe means connecting said washing liquid tank and said conduit means;

said wiper motor being disposed in a space defined between said windshield and said steering handlebar;

said washing liquid tank being disposed in the space defined between said windshield and said steering handlebar in proximity to said wiper motor;

said washing liquid tank and said wiper motor being disposed in a substantially laterally central position on said motorcycle; and

said windshield, said wiper motor and said washing liquid tank being mounted on said steering handlebar.

4,531,256

HIGH VACUUM APPARATUS

William H. Anderson, Omaha, Nebr., assignor to Dunrite, Inc., Fremont, Nebr.

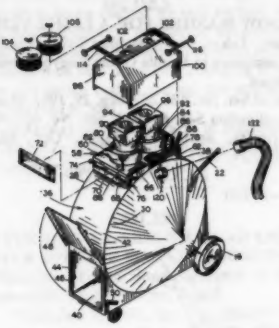
Filed Apr. 26, 1984, Ser. No. 603,928
Int. Cl.³ A47L *5/36*
U.S. Cl. 15—300 A **12 Claims**

1. A high vacuum apparatus, comprising

a main tank comprising a pair of upstanding round side walls having substantially circular peripheral edges, a peripheral front, bottom and rear wall structure interconnecting said peripheral edges, said tank being open at the top for exhausting air therefrom and said tank including an air/material inlet opening through an upper portion of one side wall,

a vacuum source closing the top of said tank and operative to

exhaust air therethrough thereby creating a vacuum within said tank,



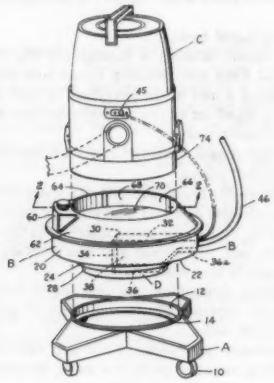
said upstanding side walls being substantially conical in shape with centers extended outwardly in opposite directions whereby said tank is wider at the center than at the peripheral edge thereof.

4,531,257

APPARATUS FOR CLEANING CARPET

Ray Passien, Rte. 3, Box 291, Klamath Falls, Oreg. 97601

Filed Nov. 10, 1983, Ser. No. 550,366
Int. Cl.³ A47L *11/34*
U.S. Cl. 15—321 **16 Claims**



1. Apparatus for cleaning carpet of the type havinga wet-dry vacuum tank unit and a vacuum hose connected to said vacuum tank having a vacuum head, a portable base for supporting and moving said apparatus above the floor, socket means carried by said portable base, said apparatus comprising:

a cleaning solution tank for containing a cleaning solution having a pump housing formed therein;

a liquid pump carried in said pump housing having a suction side adapted for connection to said cleaning solution contained in said solution tank;

said liquid pump having a pressure side adapted for connection to a flexible solution delivery hose for delivering cleaning solution to the carpet;

a lower attachment body portion included in said solution tank having a configuration generally conforming to that of said socket means so that a generally one-to-one fi is had between said socket means of said portable base and said lower attachment body portion of said solution tank;

an upper attachment body portion formed on an upper surface of said solution tank having a contoured attachment surface for attachably mating with said vacuum tank unit; and

a base portion of said vacuum tank and said upper attachment body portion of said solution tank having a generally one-to-one fit for mating together so that said portable base, solution tank, and vacuum tank are fitted together in an integral stable configuration;

said base portion of said vacuum tank having a configuration generally conforming to that of said socket means so that a generally one-to-one fit is had between the base portion of said vacuum tank and said socket means;

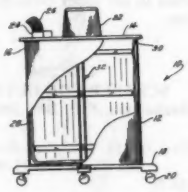
whereby said solution tank can be readily removed from and inserted into said socket means when it is desired to change from a wet type vacuum cleaner to a regular vacuum cleaner.

4,531,258

REFUSE BAG FRAME FOR VACUUM CLEANERS

Stanley Spellman, 75 Cedar Dr., Roslyn, N.Y. 11576

Filed May 22, 1984, Ser. No. 613,076
Int. Cl.³ A47L *5/00*
U.S. Cl. 15—327 R **21 Claims**



1. A refuse bag frame for supporting a refuse bag in a vacuum cleaner, said vacuum cleaner having a cylindrical bin lined by said refuse bag and a cover for the cylindrical bin including a vacuum blower and collection inlet, the rim of the open end of the refuse bag being clamped between the rim of the cylindrical bin and the cover, said refuse bag frame comprising:

(a) at least one hoop having a diameter no greater than the internal diameter of said cylindrical bin;

(b) a plurality of spaced apart, rigid, vertical supports, each support having a length no greater than the internal length of said cylindrical bin and having a channel-like cross-sectional configuration with opposing flanges and pairs of aligned vertical slots, each slot of a pair being formed in a flange opposite the other slot and adapted to receive said hoop therethrough; and

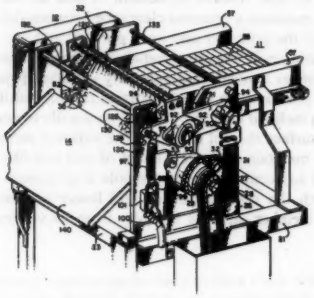
(c) means for fastening said at least one hoop to said plurality of spaced apart vertical supports to form a cylindrically-shaped frame dimensioned to fit within the refuse bag lining the cylindrical bin of said vacuum cleaner, said fastening means including a plurality of circumferentially spaced apertures in said at least one hoop, a plurality of apertures disposed along the length of each vertical support and associated with said pairs of vertical slots, and a plurality of fasteners adapted to be inserted into said apertures in said at least one hoop and said vertical supports to fasten them together.

4,531,259

MEAT TENDERIZER APPARATUS

Edward W. Bridge, Jr., c/o Bridge Machine Co., Inc., Kennedy St., Palmyra, N.J. 08065

Filed Oct. 31, 1983, Ser. No. 547,024
Int. Cl.³ A22C 9/00
U.S. Cl. 17—26 **3 Claims**



1. Apparatus for tenderizing pieces of meat which may be of even or of irregular shape which comprises

a meat feeder means,

a meat treatment means to receive and treat meat from said meat feeder means which includes

a rotating shaft transversely mounted in said apparatus on fixed center end locations,

a plurality of spaced serrated rotary knife blades carried by said shaft,

at least two fixed transverse shafts attached to said apparatus below said shaft,

a plurality of stripper wires mounted to said fixed shafts which extend upward and between said rotary knife blades,

a second rotating shaft transversely mounted in said apparatus above said first shaft,

said second shaft has its ends journaled in arms that are independent of each other, and pivotally attached to said apparatus,

resilient means attached to each said arm urging said arm and said shaft end towards said first shaft,

a plurality of spaced serrated rotary knife blades carried by said second shaft,

at least two transverse shafts attached to said arms above said second shaft,

a plurality of stripper wires mounted to said fixed transverse shafts which extend down and between said rotary knife blades, and

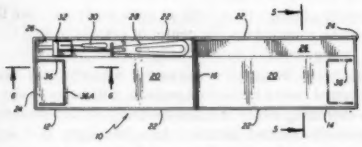
driving means to rotate said rotating shafts and said blades.

4,531,260

FISH FILLETING KIT

George F. Klamm, 8319 Caughdenoy Rd., Clay, N.Y. 13041

Filed Jul. 7, 1983, Ser. No. 511,520
Int. Cl.³ A22C 25/00
U.S. Cl. 17—70 **6 Claims**



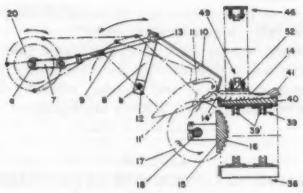
1. In a fish filleting kit having a pair of substantially identical mating sections that are permanently hinged together so that when folded one upon the other they form a compact, portable carrying case and when unfolded they open out to jointly form an elongated work surface, wherein the improvement consists of each mating section having an elongated planar work surface in its open condition and an elongated recess for receiving waste material that is coextensive with one side of the work surface, the width of the work surface being substantially greater than that of the recess, and a unitary retaining bar overlying the work surface of one of the mating sections, the bar being engageable with a gill of the fish being filleted.

4,531,261

APPARATUS FOR SCRAPING OFF HEADS OF FISH AND CRUSTACEA

Hideaki Sanaka, Amagasaki, Japan, assignor to Daieigiken Inc., Amagasaki, Japan

Filed Feb. 15, 1977, Ser. No. 768,898
Claims priority, application Japan, Feb. 16, 1976, 51-16417; Feb. 16, 1976, 51-16418
Int. Cl.³ A22C 29/02
U.S. Cl. 17—71 **5 Claims**

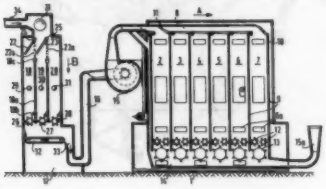


1. An apparatus for scraping off portions such as the heads (**14'**) of fish and the crusts of crustacea (**14**), comprising: a feeding device (**36**) for carrying the fish and crustacea so that the portions to be scraped off remain substantially parallel, being exposed sideways; means for scraping off the portions that are placed on said feeding device, in a direction orthogonal to the feeding direction by said feeding device; a device (**46**) for pushing abdominal portions of the fish and crustacea against said feeding device, the fish and crustacea being placed on said feeding device, located at least in the operating region of said scraping-off means; the latter being provided with a pawl plate (**10**) which hitches the portions to be scraped off; a support member (**15**) for receiving reverse sides of the portions that said pawl plate hitches and moves along a scraping-off direction; means for simultaneously operating said pushing device and said scraping-off means on a plurality of fish and crustacea placed parallel on said feeding device; wherein the latter carries the fish and crustacea continuously; said pushing device and said scraping-off means including means (**2** to **6**, **6'**, **22** and **28** to **35**) for pushing the travelling fish and crustacea before the scraping-off operation, while the fish and crustacea are moved parallel with and aligned with the feeding direction; and means for reciprocating said scraping-off means, parallel with said feeding device, to effect the scraping-off operation, while moving at an equal speed along the feeding direction, the width of the reciprocating motion being one-half of the operating width of said scraping-off means.

4,531,262
SYSTEM FOR BLENDING TEXTILE FIBERS

Werner Reiche, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,526
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151063
Int. Cl.³ D01G 13/00
U.S. Cl. 19—145.5 9 Claims



1. In a system of a plurality of serially-connected fiber processing machines, including a blender having an inlet, a plurality of generally vertically oriented first hoppers, means for charging said first hoppers in succession from above, and discharge means for removing textile fibers mixed in said blender; the improvement wherein said system comprises

(a) a pre-blender having

(1) at least two generally vertically oriented second hoppers for pre-mixing textile fibers with an at least two-fold doubling and

(2) an outlet for discharging textile fibers pre-mixed in the pre-blender;

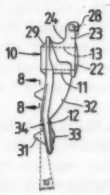
(b) a conveyor duct connecting the outlet of said pre-blender with the inlet of said blender; and

(c) pneumatic means for conveying textile fiber by a gas stream in said conveyor duct from the outlet of said pre-blender in the inlet of said blender, whereby short-wave defects in fiber material batches are equalized.

4,531,263
GUY ATTACHING DEVICE FOR ATTACHMENT TO A UTILITY LINE POLE

Gaddis G. Hall, P.O. Box 6699, Birmingham, Ala. 35210

Filed Apr. 19, 1984, Ser. No. 602,017
Int. Cl.³ F16I 3/06
U.S. Cl. 24—115 K 16 Claims



16. In a guy attaching device for attachment to a utility line pole and the like having a horizontal opening therethrough comprising:

(a) a body member having an upper hub portion with a generally horizontal passageway therethrough for receiving a throughbolt provided with a retaining head, nut or the like,

(b) a forward bearing surface on said hub portion surrounding the forward end of said passageway in position to engage said head, nut or the like,

(c) an upstanding neck portion formed integrally with said hub portion adjacent said forward end of said passageway and having a convexly curved rearward side as viewed in horizontal cross section in position to receive a loop of a guy member,

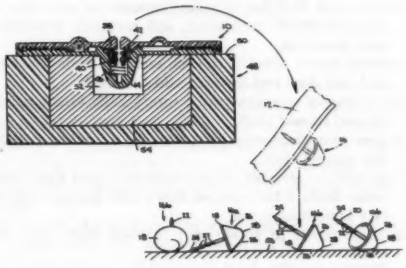
(d) a generally annular projection on said hub portion surrounding the rear end of said passageway in spaced relation to said neck portion and extending generally perpendicular to said passageway in position to engage the adjacent surface of the pole surrounding said horizontal opening therethrough to limit inward movement of said device into the pole and maintain a constant clearance between the adjacent surface of the pole and said neck portion, and

(e) a depending pole engaging pad-like member carried by said body member beneath said generally annular projection on said hub portion with a lower portion of said pad-like member being inclined forwardly and downwardly in position for the rear surface thereof to engage the adjacent surface of the pole and maintain full area contact of said pad-like member with said adjacent surface of the pole at maximum working loads with the rear surface of said lower portion of said pad-like member tapering laterally from its vertical center line.

4,531,264
THEFT DETECTION SYSTEM TARGET FASTENER

Arthur J. Minasy, Woodbury, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,727
Int. Cl.³ A44B 9/00
U.S. Cl. 24—155 BR 10 Claims



1. A tack-like fastener element for releasably and securely attaching plastic theft detection wafers to articles of merchandise, said fastener element comprising an expansive head and an eleongated pointed shank securely attached to and extending out from said head, said pointed shank being formed with axially spaced circumferential grooves for releasable attachment to a locking mechanism on a wafer, said head having a conical outer configuration with an apex angle less than ninety degrees and a rounded tip, the center of gravity of said fastener element being located substantially farther away from said rounded tip than its center of curvature whereby said element, when dropped onto a horizontal surface, will come to rest with its point extending either in a downwardly slanted direction or in an upwardly slanted direction less than forty five degrees from the horizontal so that, if pressed down upon the point will be pushed down without appreciable resistance.

4,531,265

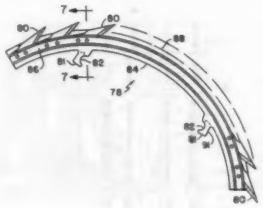
CUTTING ROTOR BLADE SEGMENT

Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 571,730, Jan. 18, 1984, abandoned, which is a division of Ser. No. 390,320, Jun. 21, 1982, Pat. No. 4,498,217. This application Nov. 23, 1984, Ser. No. 674,704

Int. Cl.³ D06C *13/08*

U.S. Cl. 26—9 **3 Claims**



1. A cutting blade segment for a cutting rotor comprising: a molded arcuate member having an arcuate inner and outer surface, said arcuate surfaces being in substantially the same plane and being spaced from one another to form a space therebetween, a plurality of cutting blades adjacent said outer surface abutting the top of said inner surface and projecting upwardly from said outer surface, a locking portion molded to said inner and outer surfaces adjacent said cutting blades in the space between said surfaces to maintain said cutting blades in the desired position and a plurality of tab members attached to the arcuate inner surface and projecting in a direction opposite to the cutting blade, said tab members having a concave surface adapted to contact a locking bar.

4,531,266

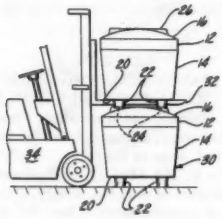
BURIAL VAULT STRUCTURE

James W. Darby, 2117 Smith, and David L. Darby, 501 Brickyard Rd., both of Danville, Ill. 61832

Filed Jun. 22, 1983, Ser. No. 506,840

Int. Cl.³ A61G *17/00*

U.S. Cl. 27—35 **5 Claims**



1. A burial vault comprising:
an elongated box portion having a top, a bottom, two elongated sides and two ends,
an elongated lid having a top and a bottom, said lid being dimensioned so that its bottom covers the top of said box portion,
a plurality of spaced rests attached to the bottom of the box portion so that said rests protrude downwardly from the bottom of the box portion, said plurality of rests comprising at least two longitudinally spaced rests adjacent each side of the box portion, and
a plurality of recesses formed on the top of the lid, said recesses registering with and adapted to abuttingly receive said rests,
wherein said rests and said recesses are dimensioned so that, with the rests on one box portion positioned within and supported by the recesses on one lid, the bottom of said one box portion is spaced upwardly from the top of said one lid thereby forming a space between said top of the lid and said bottom of said box portion, said space being open to said sides and being adapted to allow the engagement of lifting means with said bottom of said one box portion; and
wherein said rests comprise the sole means for supporting said one box portion on said one lid.

4,531,267

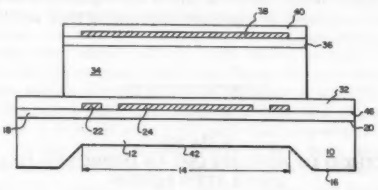
METHOD FOR FORMING A PRESSURE SENSOR

Michele Royer, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 363,693, Mar. 30, 1982, Pat. No. 4,445,384. This application Jan. 26, 1984, Ser. No. 552,878

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **1 Claim**



1. A method of forming a pressure sensor, comprising:
providing a semiconductor body having a first surface and a second surface;
forming a pair of electrodes encapsulated in dielectric onto the first surface;
forming a layer comprising piezoelectric material onto the dielectric encapsulating the pair of electrodes, the layer having a first surface in contact with the dielectric and a second surface;
forming an electrode encapsulated in dielectric onto the second surface of the layer; and
etching a portion of the semiconductor body from the second surface of the semiconductor body in order to form a diaphragm in the semiconductor body.

4,531,268

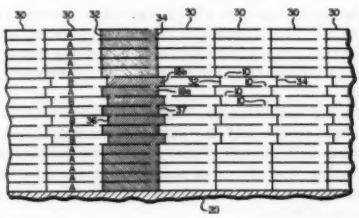
METHOD OF MAKING CAPACITIVE STRUCTURES

Charles C. Rayburn, Lynchburg, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 238,717, Feb. 27, 1981, abandoned. This application Mar. 15, 1983, Ser. No. 475,569

Int. Cl.³ H01G *4/30*

U.S. Cl. 29—25.42 **20 Claims**



1. A method of making capacitive structures comprising: providing first and second webs of material, each having a dielectric substrate, a metallic film coating, and narrow parallel longitudinal metal-free zones; slitting said webs along parallel lines that are offset from said metal-free zones to form ribbons,

each of which has a narrow marginal metal film band extending inwardly from one longitudinal edge of the ribbon to said metal-free zones; winding said ribbons from said first and second webs alternately on at least one drum and in said winding offsetting the ribbons of one web from the ribbons of the other web to form on each of said at least one drum a plurality of adjacent interleaved rings of capacitive structure, each having alternately disposed metal and dielectric layers and with there being in each structure the layers from the ribbons of each web respectively projecting laterally outwardly from said marginal metal film bands of the ribbons of the other web; separating said interleaved rings of capacitive structure and transversely severing said interleaved rings of capacitive structure to form ropes of capacitive structure, each of said rings of capacitive structure yielding at least one of said ropes of capacitive structure; subjecting said ropes of capacitive structure to pressure and coating the laterally projecting parts of each of said ropes of capacitive structure with a metal substance to electrically connect the metal film of the respective ribbons of each of said ropes of capacitive structure to form lengths of capacitive structure.

4,531,269

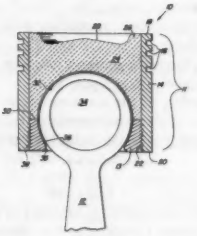
METHOD OF ASSEMBLING AN IMPROVED HEAT INSULATED PISTON

Gary A. LaBouff, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 280,403, Jul. 6, 1981, Pat. No. 4,459,900. This application Mar. 26, 1984, Ser. No. 593,460

Int. Cl.³ B23P *15/10*

U.S. Cl. 29—156.5 R **4 Claims**



1. A method of assembling an improved heat insulated piston and attaching the same to a connecting rod having a spherical ball shaped end, said piston including a sleeve surrounding a heat insulated core having a hemi-spherically shaped cavity formed in one end thereof, said method comprising:

(a) placing said core on a flat surface in an inverted position with said hemi-spherically shaped cavity facing upward;

(b) thermally expanding said sleeve by heating it to approximately 60 percent of the melting point of the sleeve material;

(c) placing said thermally expanded sleeve in an inverted position around said core such that one end of said sleeve is flush with the end of said core on the flat surface;

(d) cooling said sleeve to room temperature to form an interference fit with said core thereby forming a heat insulated piston;

(e) placing said retaining ring around said connecting rod adjacent to said spherical ball shaped end;

(f) positioning said heat insulated piston on said spherical ball shaped end of said connecting rod; and

(g) attaching said retaining ring to said sleeve to form an assembly between said piston and said connecting rod;

4,531,270

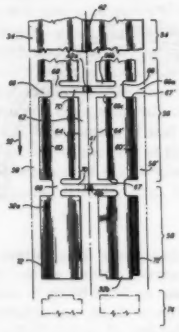
METHOD FOR THE MANUFACTURE OF METAL VANES FOR TURBOMACHINERY

James B. Griffith, Ellington, and Harold C. Sanborn, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 13, 1984, Ser. No. 620,292

Int. Cl.³ B21K *3/04;* **B23P** *15/02*

U.S. Cl. 29—156.8 B **4 Claims**



1. The method of making a cambered airfoil article which comprises

(a) form rolling a flat strip to produce a formed strip with a cross section having a planar first side and an opposing contoured second side, the cross section characterized by two opposing airfoil contours separated by a center rib running in a line along the length of the strip;

(b) guiding the formed strip into a die using the rib and slotting the strip to create transverse and longitudinal openings therein to define essentially rectangular airfoils on opposing sides of the rib line with each airfoil connected by a web to a longitudinally adjacent airfoil; the opposing longitudinal webs on either side of the rib centerline connected to each other by cross webs;

(c) bending the rectangular airfoils so connected by webs, to make the planar sides thereof concave, and to form each member into a cambered airfoil; and

(d) separating the cambered airfoils from the webs.

4,531,271

METHOD FOR MANUFACTURING A ROTATIONALLY SYMMETRICAL CONSTRUCTION PART

Manfred Lechner, Munich, and Kurt Stich, Unterhaching, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Division of Ser. No. 41,249, May 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 854,317, Nov. 23, 1977, abandoned, which is a continuation of Ser. No. 683,651, May 6, 1976, abandoned. This application Jun. 13, 1980, Ser. No. 159,385

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522681

The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—157 C **6 Claims**

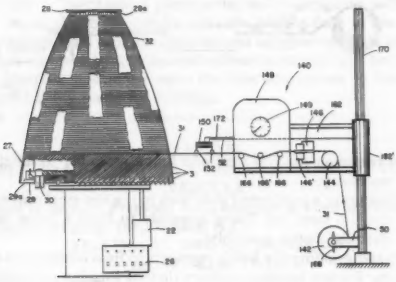
1. A method of forming a rotationally symmetrical constructional part having an irregular longitudinal peripheral wall consisting of a plurality of juxtaposed tubes (3) which are arranged side-by-side and spirally wound about the axis of symmetry of the constructional part comprising the steps of:

rigidly mounting the constructional part to a mounting core (27) which has an outer periphery conforming to the inner surface of the constructional part;

forming a wire (31) into a non-circular cross-section having substantially parallel opposite flat side contact surfaces;

rotating the constructional part;

wrapping the constructional part as it rotates, tightly with the wire so that an opposite flat side contact surface of the wire in one turn of the wrapping firmly slides into substantially parallel engagement with an opposite flat side contact surface of the wire in a previous turn of the wrapping on the constructional part;



feeding the wire which is being wrapped on the constructional part substantially perpendicularly to the axis of symmetry of the constructional part;

thereafter removing the wire from the constructional part section by section to expose the tubes;

permanently joining the exposed tubes to each other in the exposed sections; and forming said wire with a quadrangular cross-section having said opposite flat side contact surfaces.

4,531,272

VALVE ASSEMBLY METHOD

Frederick Cohen, 1500 W. Church St., Orlando, Fla. 32803

Filed Jun. 30, 1980, Ser. No. 164,037

Int. Cl.³ B23P *15/00, 7/00*

U.S. Cl. 29—157.1 R **14 Claims**

1. A method of making a replacement valve assembly comprising the steps of:

removing an existing valve assembly;

cutting a threaded rod to a predetermined length in accordance with the removed existing valve assembly;

cutting a sleeve having an internally threaded bore therethrough to make a stem portion in accordance with the removed existing valve assembly;

selecting an externally threaded member having a threaded bore therein to match the internal threads of the valve having the valve assembly removed with the external threads of said selected member;

selecting a valve element of fit said cut threaded rod in accordance with the removed valve assembly;

coating said cut threaded rod that a fluid material to bind components thereto; and

assembling said cut sleeve, selected threaded member having a threaded bore therein and selected valve element onto said coated cut threaded rod to form a valve assembly.

4,531,273

METHOD FOR FABRICATING GRAPHITE FILLED SINTERED METAL SEATS FOR BALL VALVES

Richard T. Smith, Ipswich, N.H., and Robert H. Osthues, Holden, Mass., assignors to Worcester Controls Corporation, West Boylston, Mass.

Continuation of Ser. No. 411,943, Aug. 26, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 668,689

Int. Cl.³ B21D *53/00*

U.S. Cl. 29—157.1 R **4 Claims**

1. A method of making a ball valve seat operable at temperatures up to 1000° F. and pressures up to 1000 psi, comprising the steps of fabricating a ring-shaped metal body by compacting a mass of corrosion resistant powdered metal particles and thereafter sintering said compacted mass of powdered metal particles, the interior of said body having interparticulate spaces and the exterior of said body being shaped to define an annular surface adapted in use for engagement with the exterior of a rotary valve ball, pumping a dispersion of graphite particles in a liquid carrier through said ring-shaped metal body via the interparticulate spaces of said body and then drying said metal body to remove any portion of the liquid carrier which remains in said interparticulate spaces thereby to leave a residue in the interparticulate spaces of said ring-shaped sintered powdered metal body consisting essentially of dry graphite particles, and thereafter coining said body by applying pressure to the exterior of said sintered powdered metal body in a magnitude sufficiently high to collapse any voids which remain in said body after said drying step thereby to securely bind the dry graphite particles in said interparticulate spaces into said ring-shaped metal body and to produce a composite metal/graphite valve seat having substantially no porosity and having substantially uniform density throughout, said conining step being effected after said drying step without any intervening method step that would alter the physical nature of the dry graphite particle residue remaining in said interparticulate spaces after said drying step.

4,531,274

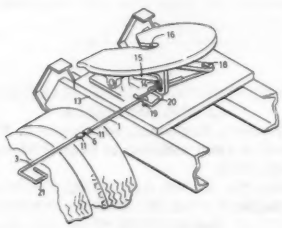
UNLATCHING TOOL TO UNCOUPLE SEMI-TRAILER TRUCKS

Joseph E. Sanders, 622 Montrose, Romeoville, Ill. 60441

Filed Dec. 14, 1983, Ser. No. 561,420

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—267 **8 Claims**



1. An unlatching tool to uncouple the trailer from the tractor of a semi-trailer truck rig, comprising an elongated bar having a first working end region and a second opposite end region, said first working end region including safety release means to release a safety mechanism which prevents unlatching of the coupling mechanism that couples a said trailer to a said tractor

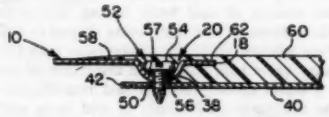
of a semi-trailer truck rig until such safety mechanism has been released, said safety release means including a straight arm extending outwardly in one direction away from the longitudinal axis of said elongated bar, and an unlatching hook to unlatch said coupling meachanism to enable uncoupling of said trailer from said tractor, said unlatching hook including a curved return portion extending in a direction back toward said second end region of said elongated bar, said unlatching hook extending outwardly away from the longitudinal axis of said elongated bar in the opposite direction from that in which said straight arm extends and from a location on said elongated bar which is spaced apart inwardly thereof from the location of said straight arm.

4,531,275

METHOD OF REPAIRING AUTOMOBILE BODIES

Edward F. Kelly, 3514 Palmer Dr., Rocky River, Ohio 44116

Filed Jan. 24, 1983, Ser. No. 460,295
Int. Cl.³ B23P *7/04*
U.S. Cl. 29—402.12 **6 Claims**



1. A method of repairing damaged automobile sheet metal comprising the steps of removing damaged sheet metal from the damaged area, forming a plurality of dimples in the sheet metal at intervals around the perimeter of the damaged area with the dimples projecting rearwardly at the backside of the sheet metal and forming recesses in the front side of the sheet metal, forming holes in the dimples at the bottom of the recesses and corresponding holes in a patch, holding the patch against the backsides of the dimples and in underlying and coextensive relation to the damaged area while attaching the patch to the sheet metal by means of fasteners extending through the holes in the bottom of the dimples and the patch from the front side of the sheet metal, with the heads of the fasteners received in the recesses so formed and with portions of the patch rearwardly spaced by the dimples from the backside of the sheet metal to form gaps between the patch and sheet metal around the perimeter of the damaged area, and applying a body filler to the surface of the patch exposed through the damaged area and to the exterior of the sheet metal surrounding the damaged area to cover the damaged area and the recesses and fasteners heads contained therein so that the patch and fastener heads are completely covered and hidden from view when the repair is completed, and with some of the body filler being forced into the gaps between the patch and sheet metal around the perimeter of the damaged area to interlock securely the body filler with the sheet metal and patch.

4,531,276

METHOD OF MAKING A DRUM BRAKE SHOE AND LINING ASSEMBLY

Edward H. Warwick, Englewood, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 385,494, Jun. 7, 1982, Pat. No. 4,453,621. This application Dec. 27, 1983, Ser. No. 565,470
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—417 **3 Claims**

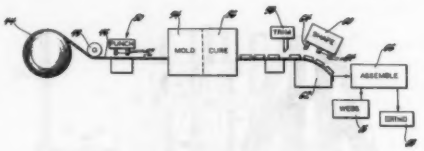
1. The method of making a drum brake shoe aand lining assembly comprising the steps of:

(a) passing a flat strip of brake shoe rim steel through a die and punching holes therein for attaching the lining and the shoe web;

(b) molding a series of lining segments onto said brake shoe rim steel including molding lining segments into holes punched therein, forming a rim steel strip and lining assembly;

(c) curing the series of lining segments;

(d) bending the strip of brake shoe rim steel at each crosswise location between the lining segments to form a chordally defined shoe arc with the brake shoe rim steel remaining flat under each lining segment;



(e) trimming the rim steel and lining assembly to length as necessary;

(f) securing a preformed shoe web to the rim steel portion of the rim steel and lining assembly to form a drum brake shoe and lining assembly;

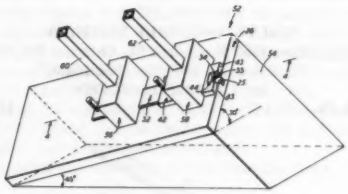
(g) and grinding the lining segments to final dimensions with the friction braking surfaces thereof forming segments of a curved arc.

4,531,277

ASSEMBLING COMPONENTS HAVING MATING FACES

Richard K. Beltz, Hamburg, and Donald M. Large, Temple, both of Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,294
Int. Cl.³ B23Q *3/00*
U.S. Cl. 29—466 **18 Claims**



10. Apparatus for assembling at least one first component having an external surface opposite a mating face to at least one second component having a mating face complementary with and joinable to the mating face of the first component, comprising:

at least one assembly station formed on an upwardly extending, leading edge portion of a base, said base being inclined therefrom in a given direction sufficiently that a first component, supported with its mating face upturned and its external surface in contact with the base, and a second component, supported with its mating face in contact with the upturned mating face of the first component, will readily slide relative to each other and the base within said assembly station by the force of gravity;

a first plate, supported on and inclined with the base, and having along a leading edge substantially parallel to the leading edge of the base, at least one first opening containing first reference means for stopping sliding of, and thereby positioning the first component on the base in said assembly station;

a second plate, disposed over and inclined with the first plate, and having along a leading edge substantialy parallel to the leading edges of the base and the first plate, at least one second opening containing second reference

means for stopping sliding of, and thereby positioning the second component on the first component with a desired registration of respective mating faces in said assembly station;

means for guidably delivering into at least the first opening in the first plate, a first component with its external surface in contact with the inclined base such that said first component slides to and is stopped by the first reference means and becomes thereby positioned within said assembly station; and

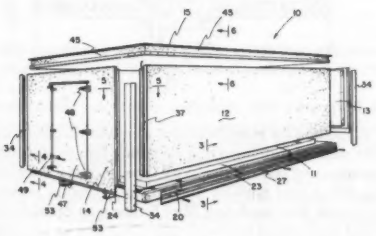
means for guidably delivering into at least the second opening in the second plate, a second component with its mating face in contact with the mating face of the first component such that said second component slides to and is stopped by the second reference means and becomes thereby positioned upon the first component to form an assembly ready for bonding.

4,531,278

METHOD OF FORMING AN INSULATED BODY FOR A VEHICLE

Royce B. Boykin, Fremont, N.C., assignor to Hackney Brothers Body Company, Inc., Wilson, N.C.

Filed Dec. 13, 1982, Ser. No. 449,220
Int. Cl.³ B23P *21/00*
U.S. Cl. 29—469 **9 Claims**



1. The method of forming an insulated frameless body for a vehicle comprising: manufacturing a spaced wall entire vehicle bottom assembly, spaced wall entire vehicle side assemblies, and a spaced wall entire vehicle top assembly; insulating by filling said spaced wall vehicle body bottom, side and top assemblies; shipping said insulated vehicle assemblies in knockdown form from the point of manufacture to an assembly point; and joining said insulated vehicle assemblies to form an insulated enclosure whereby an highly efficient and yet readily shipped means is provided.

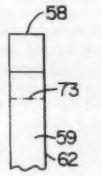
4,531,279

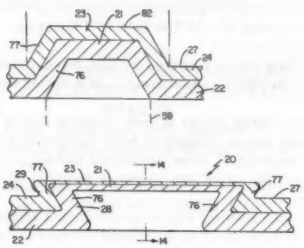
METHOD OF MAKING A LEAKPROOF JOINT

James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 23, 1982, Ser. No. 410,438
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—509 **2 Claims**

1. In a method of making a leakproof joint construction for a pair of members disposed in abutting relation comprising the steps of deforming a substantially rectangular part of one of said members into an adjacent substantially rectangular part of the other of said members so that said parts of said members are disposed completely beyond the plane of the outer surface of said other member while respectively being integrally interconnected to the remainder of said members by substantially straight sided tubular portions of said members, and interlocking said parts together by an outward staking of one pair of opposed sides of said tubular portion of said part of said one member into said tubular portion of said other member by compacting said parts together, the improvement wherein said step of deforming forms said one pair of opposed sides of said one member to each be disposed at an acute angle relative to said plane of said other member and the other pair of opposed sides thereof to each be substantially at a right angle relative to said plane of said other member and said step of staking causes





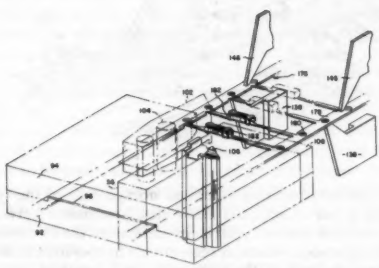
said one pair of opposed sides of said one member to each toggle over center so as to be disposed at an obtuse angle relative to said plane of said other member while said other pair of opposed sides each remain substantially at said right angle to said plane of said other member.

4,531,280

MODULAR UNIT ASSEMBLY MACHINE

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 26, 1979, Ser. No. 623,934
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—564.6 **13 Claims**



1. In an assembly machine for sequentially inserting electrical terminals into respective cavities of connector housings, said assembly machine having a power source, a connector housing feed and indexing means, and a terminal strip feed path, at least one modular insertion unit, each said unit comprising:

a housing adapted to be selectively positioned on said assembly machine along said feed path for said terminal strip;

drive means within said housing adapted to connect said

modular unit to be driven by said power source of said machine, said drive means having

a drive shaft rotatably mounted in said housing,

means connecting said drive shaft to said power source to impart alternate rotary motion to said shaft,

first cam means secured to said shaft,

means connecting said first cam means to impart motion to said terminal feed means,

second cam means secured to said shaft,

means connecting said second cam means to impart motion to said terminal severing means,

third cam means secured to said shaft, and

means connecting said third cam means to impart motion to said terminal stuffing means;

said means connecting said first cam means to impart motion to said terminal feed means having

a lever pivotally mounted intermediate its ends;

a cam follower on one end of said lever engaging said first cam; and

cam means on the opposite end of said lever to convert the rotary motion of said first cam to a linear motion to feed said terminal strip;

terminal feed means powered by said drive means to feed a strip of terminals to a severing station within said modular unit;

terminal severing means at said severing station including clamping means adapted to hold the terminal in position while severing it from associated carrier strips and to subsequently move the clamped terminal to a stuffing station, and

means at said stuffing station to drive said terminal into a respective cavity of an associated connector housing.

4,531,281

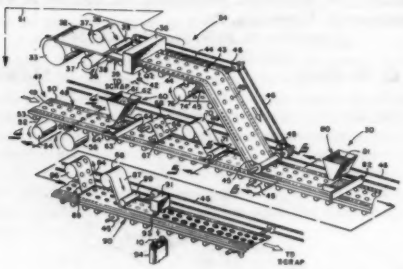
METHOD USEFUL IN THE MANUFACTURE OF ELECTROLYTIC CAPACITORS

Myles N. Murray, Chagrin Falls, and Joseph Murphy, Macedonia, both of Ohio, assignors to Industrial Electronic Rubber Company, Twinsburg, Ohio

Filed Apr. 18, 1983, Ser. No. 486,047

Int. Cl.³ H01G *9/00, 13/00*

U.S. Cl. 29—570 **17 Claims**



1. A method of making electrical storage cells of the type including a pair of opposed electrodes, a separator between and in operative contact with inner surfaces of the electrodes, a pair of electrode connectors respectively in operative contact with outer surfaces of the electrodes, and a pair of gaskets respectively confining the electrodes between the separator and respective electrode connectors, said method comprising the step of integrally forming a plurality of such cells in a composite belt for subsequent separation from such belt to provide individual cells, the composite belt being formed by assembling together an inner sheet of separator material, outer sheets of connector material at opposite sides of the inner sheet, intermediate sheets of gasket material between the inner sheet and respective outer sheets with respective holes in each intermediate sheet aligned with the holes in the other intermediate sheet and spanned at opposite ends by the inner sheet and respective outer sheets, and pairs of opposed electrodes respectively within the holes in the intermediate sheets with opposite surfaces thereof respectively in operative contact with the inner and respective outer sheets.

4,531,282

BIPOLAR TRANSISTORS HAVING VERTICALLY ARRAYED COLLECTOR-BASE-EMITTER WITH NOVEL POLYCRYSTALLINE BASE ELECTRODE SURROUNDING ISLAND EMITTER AND METHOD OF MAKING SAME

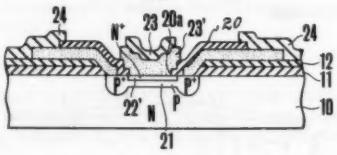
Tetsushi Sakai, Sayama; Yoshizi Kobayasi; Hironori Yamauchi, both of Tokyo, and Yoshinobu Arita, Hoya, all of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo, Japan

Division of Ser. No. 524,470, Aug. 19, 1983, which is a continuation of Ser. No. 158,784, Jun. 12, 1980, which is a continuation of Ser. No. 898,074, Apr. 20, 1978. This application Jan. 17, 1984, Ser. No. 571,453

Claims priority, application Japan, Apr. 25, 1977, 52-46737

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—578 **5 Claims**



1. A method for manufacturing a bipolar transistor comprising the steps of forming a first insulating film on a semiconductor substrate of one conductivity type; forming a second insulating film doped with an impurity of a second conductivity type on said first insulating film; forming an opening through said first and second insulating films; forming an ion-implanted insulated region at a portion of said semiconductor substrate exposed in said opening by using said opening as a mask; forming a non-doped polycrystalline silicon layer on surface of said exposed semiconductor substrate and said second insulating layer; heat treating the substrate to diffuse the impurity from said second insulating film so as to convert portions of said polycrystalline silicon layer, not overlying said insulated region, to said second conductivity type and to form a diffused region doped with the impurity of said second conductivity type around said insulated region on said substrate; removing a non-doped polycrystalline silicon layer on said insulated region; forming a third insulating film on the surface of said exposed semiconductor substrate and said polycrystalline silicon layer; forming a base and emitter diffusing opening through a portion of said third insulating film in said first mentioned opening; forming a base region through said diffusing opening on said exposed semiconductor substrate, said base region being contiguous to said region diffused with the impurity of said second conductivity type; forming in said base region an island shaped emitter region of said first conductivity type; and forming base and emitter electrodes.

4,531,283

PORTABLE SPLICING TOOL

Roy A. Kitchens, Montgomery, and Charles K. DeGroff, Wetumpka, both of Ala., assignors to National Industries, Inc., Montgomery, Ala.

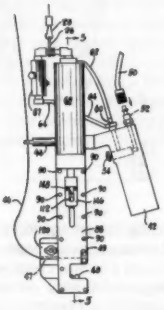
Filed May 4, 1983, Ser. No. 491,567

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—753 **2 Claims**

1. A portable hand-held splice tool for joining wires by crimping a splice band around a plurality of wires, comprising:

a frame;
a handle connected to the frame for maneuvering said splice tool;
a crimping anvil on the frame;
parallel forming bars spaced laterally and movable longitudinally on the frame relative to the anvil between first and second positions for shearing a splice band from strip stock extending into the frame laterally of the bars and for moving the band to the anvil;
a forming post carried by the frame with a portion located between said first and second positions and constructed to fit between the bars;



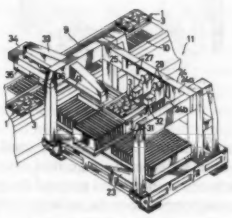
a crimping member on the frame located between and movable longitudinally of the bars toward and away from the anvil; and
two single-acting pneumatic cylinders, one connected to said forming bars and the other to said crimping member, for moving the bars and member toward and away from the anvil in a predetermined sequence;
flow control means for operating said cylinders and for delaying operation of the cylinder that moves the crimping member relative the cylinder that moves the forming bars; and
a retractable suspension for said tool, said suspension including means to counterbalance the weight of said tool.

4,531,284

AUTOMATIC ASSEMBLING MACHINE

Tamiaki Matsuura; Takeshi Aiba; Takashi Fukushima; Masanori Nishimura; Hiroshi Ohtsuki, all of Kanagawa; Fujio Yabuki, Saitama, and Tomio Kusakabe, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 390,061, Jun. 18, 1982, abandoned.
This application Sep. 6, 1984, Ser. No. 647,870
Claims priority, application Japan, Jun. 22, 1981, 56-96250
Int. Cl.³ B23P *21/00, 23/00;* **B23Q** *15/00*
U.S. Cl. 29—784 **7 Claims**



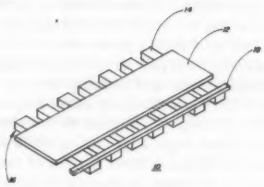
1. An automatic assembling machine for use with a carrier having sets of parts thereon, with the parts in each of said sets being in a predefined positional relationship definable by predetermined distances therebetween in two orthogonal directions, and with corresponding parts in said sets being at first and second uniform distances from each other in said two orthogonal directions, respectively, said machine comprising:
movable table means for supporting said carrier and moving in said two orthogonal directions in a horizontal plane;
mounting surface means extending above said plane of said movable table means and having first and second mounting surface portions parallel to said two orthogonal directions, respectively, said first and second mounting surface portions each having a plurality of mounting points located at said first and second uniform distances, respectively, from each other in said two orthogonal directions; and
a plurality of working unit means releasably attached, at said mounting points, to each of said first and second mounting surface portions so as to be positionally related to each other for cooperation with movements of said table means simultaneously to engage corresponding parts in said sets in each of said two orthogonal directions.

4,531,285

METHOD FOR INTERCONNECTING CLOSE LEAD CENTER INTEGRATED CIRCUIT PACKAGES TO BOARDS

Michael R. Lucas, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 477,692
Int. Cl.³ H01R *43/00;* **B32B** *3/10*
U.S. Cl. 29—827 **2 Claims**



1. A method for interconnecting a close lead center integrated circuit package to an interconnect board comprising the steps of:
forming a lead frame having a plurality of leads bonded to an insulating film material, said forming step comprising the steps of bonding a lead frame material to said insulating film material and etching said lead frame material to form said leads, said lead frame material and said insulating film material being of such materials and thickness so that when said lead frame is subsequently shaped said leads maintain their shape while maintaining their lead-to-lead spacing;
selectively removing said insulating film material from said leads where connections to said package and said board are to be made, said selectively removing step comprising the step of laser ablating said insulating film material to form an exposed portion near the lead ends, retaining a small strip of said insulating film material at said lead ends for support;
shaping said lead frame to provide stress relief in the package-to-board interconnect; and
attaching said lead frame to said package and board to form the package-to-board interface.

2. A lead frame for interconnecting a close lead center integrated circuit package to a interconnect board comprising:
an insulating film;
a plurality of leads bonded to said insulating film, said insulating film being selectively removed from said leads where interconnections to said package and said board are to be made, said leads and said insulating film being of a

material and thickness to allow said lead frame to be shaped in the form of an "S" profile in the Z-direction while maintaining lead shape and lead-to-lead spacing;

said leads comprising an exposed portion near the ends for attachment to said package and said board; and

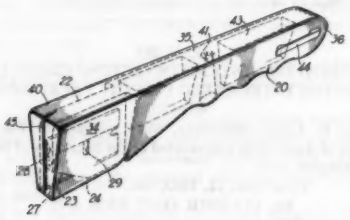
a thin strip of said insulating film being attached across said ends to support said ends.

4,531,286

CARTON CUTTING KNIFE

Raymond P. Vito, 2224 Riada Dr., NW., Atlanta, Ga. 30305, and H. Russell Boehm, 205 Governor's Dr., Forest Park, Ga. 30050

Filed Feb. 8, 1983, Ser. No. 465,001
Int. Cl.³ B67B *7/00*; B26B *29/00*
U.S. Cl. 30—2 **2 Claims**



1. A one-piece molded plastics knife for opening cartons and the like comprising an elongated hand grip portion for grasping by one hand of a user, a blade mounting extension on the forward end of the hand grip portion and having a blade receptor slot formed therein and opening through the front and bottom side of the blade mounting extension, said blade receptor slot having yielding opposite side detent elements to releasably lock a standard single edge cutting blade within the blade receptor slot, the forward lower portion of said blade mounting extension being formed on an angle to the longitudinal axis of the knife to expose the leading corner of a cutting blade held within the blade receptor slot, the top faces of said hand grip portion and blade mounting extension defining a common substantially flat surface longitudinally of the knife, the hand grip portion having a blade storage compartment formed therein and opening through said common flat surface, a combined blade guard and cover for the blade storage compartment including a thin flexible strip having its rear end joined to the rear end of the hand grip portion by a living hinge and extending forwardly longitudinally for substantially the entire length of the knife and being in covering relationship to the blade storage compartment, depending front and side walls on said strip adjacent to said cutting blade mounting extension whereby said side walls can closely straddle the cutting blade mounting extension and said front wall can lie substantially in contact with the forward end of the cutting blade mounting extension while such strip is essentially flat and in contact with said common flat surface, said front and side walls then forming a guard for the exposed corner of a cutting blade held within said blade receptor slot, a snap fastener element on the bottom of said strip forwardly of said blade storage compartment, said hand grip portion having a snap fastener receptor opening in its top face adapted to receive the snap fastener element, whereby thumb pressure applied against the top of said strip somewhat rearwardly of the cutting blade mounting extension enables the strip to function as a cantilever support spring for said guard so that the guard will yield and retract automatically in response to engagement with a surface being cut and will return automatically by spring tension to a blade guarding position following separation of the guard from the surface being cut.

4,531,287

AUTOMATICALLY OPERATING ELECTRIC SHAVER

Minoru Shibata, Tokyo, Japan; Koichi Hayashi, Dover Heights, Australia, and Katsumi Abe, Shiba, Japan, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1984, Ser. No. 609,242
Claims priority, application Japan, May 25, 1983, 58-77445[U]
Int. Cl.³ B26B *19/38*
U.S. Cl. 30—43.6 **6 Claims**

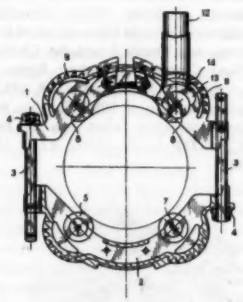
1. An automatically operating electric shaver comprising a housing provided with a shaving head, said housing comprising a power source and a motor, characterized in that there are provided a starting preliminary circuit which operates by detecting an external contact resistance, a proximity detecting circuit which operates by detecting changes in capacity between electrodes for detecting proximity, and a motor drive circuit which operates only when both of the afore-mentioned circuits operate, and in that the construction is such that the shaver starts automatically in a prescribed position and stops automatically in any positions remote from the said position.

4,531,288

PIPE-CUTTER WITH CUTTER WHEELS AND YOKES

Claude Aubriot, Damery, France, assignor to VIRAX, Epernay, France

Filed Jul. 26, 1983, Ser. No. 517,327
Claims priority, application France, Jul. 26, 1982, 82 12979
Int. Cl.³ B23D *21/08*; B26D *3/16*
U.S. Cl. 30—99 **8 Claims**



1. A pipe cutter assembly which can be used to cut a pipe located in a narrow trench, said pipe cutter comprising

two yokes which can be mounted around the pipe to be cut, each yoke having opposite ends, an inner side and an outer side, each yoke including two rotatable cutter wheels which have a cutting edge that protrudes from the inner side of the associated yoke; two curved ratchet sectors which are respectively located near the opposite ends of the associated yoke, each curved ratchet sector including a plurality of spaced apart teeth which extend away from

the outer side of the associated yoke, each curved ratchet sector defining an imaginary center axis; and two bosses, each boss being positioned such that the center axis of a respective curved ratchet sector passes therethrough;

each of said wheels defining an imaginary center axis, and wherein each cutter wheel is mounted on the respective yoke such that its imaginary center axis is coincident with the imaginary center axis of a respective curved ratchet sector;

two coupling means for interconnecting the associated ends of said two yokes, each of said coupling means including a yoke coupling nut; and

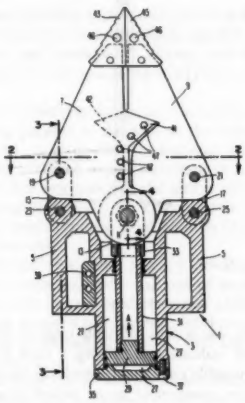
a lever for rotating said two yokes when coupled by said interconnecting coupling means around a pipe to be cut, said lever including two spaced apart arms, at least one arm including a drive catch which extends towards the other arm and each arm including a forked operating end, each drive catch being abutable against a tooth of a curved ratchet sector when the forked operating ends of said arms are positioned around the periphery of the associated boss.

4,531,289

HIGH-POWER RESCUE TOOL

Francis M. Brick, Dresher, Pa., assignor to F. M. Brick Industries, Inc., Horsham, Pa.

Filed Jan. 28, 1983, Ser. No. 461,853
Int. Cl.³ B25F *1/100*; B26B *15/00*
U.S. Cl. 30—134 **11 Claims**



1. A rescue tool, comprising:

a frame,

a pair of substantially flat arms, the arms being pivotably mounted in a common yoke, the yoke being attached to a piston means disposed within the frame, the frame defining a region within which the piston means can move upward and downward, wherein upward movement of the piston means causes the arms to separate, and wherein downward movement of the piston means causes the arms to come together,

the arms being connected to the frame by a pair of links, the links being spaced equidistant from the yoke, the links being pivotably mounted to the frame and to the arms,

hydraulic means for moving the piston means upward and downward within the frame, and

blade means attached to the arms, the blade means being distinct from the arms,

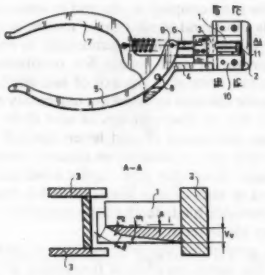
wherein both of the arms have the general shape of a solid right triangle, and wherein the arms, when together, form a substantially soild triangular shape, the arms being constructed of a graphite laminate composite material.

4,531,290

CUTTING TOOL FOR MANUAL GRAFTING

László Plesa, Szentendre, Hungary, assignor to "Aranykalasz" Mgtsz, Rackeve, Hungary

Filed Jun. 5, 1984, Ser. No. 617,469
Claims priority, application Hungary, Jun. 17, 1983, 2174/83
Int. Cl.³ A01G *1/06*
U.S. Cl. 30—178 **5 Claims**



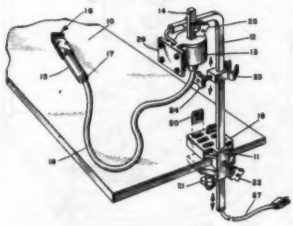
1. Cutting tool for manual grafting comprising a cutting element with curved surface, a locating element guided in a cutting direction against the cutting element for locating a plant part to be grafted and means for guiding the locating element and fitting the cutting element, wherein the cutting element on its convex surface is equipped with an edge and the cutting element is shaped on the concave side under a relief angle in the range from 0.5° to 3°, and on the convex side under a back slope angle in the range from 0.75° to 5°, both related to the cutting direction.

4,531,291

ANIMAL GROOMING CLIPPER

Kim E. Laube, Panorama City, Calif., assignor to Kelly Crisp, Canoga Park, Calif.

Filed Nov. 29, 1982, Ser. No. 444,867
Int. Cl.³ B26B *19/02*
U.S. Cl. 30—216 **6 Claims**



1. An improved clipper to be used in place of a prior art clipper of the type incorporating a motor which is manually moved with the clipper for grooming an animal placed on the surface of a grooming table, said improved clipper comprising, in combination:

(a) a clamp stand for securement to an edge of said table and having an upwardly extending support bar;

(b) an electric drive motor having a rated horsepower and rpm substantially greater than that for said motor of said prior art clipper;

(c) attachment means for securing said drive motor to the upper end portion of said support bar;
(d) an elongated clipper casing having front and rear ends and dimensioned intermediate its ends to be easily held with one hand;
(e) a clipper blade assembly holder at the front end of said casing for holding a clipper blade assembly comprised of stationary blade teeth and movable blade teeth;
(f) an elongated shaft extending axially within and bearingly supported by said casing, the forward end of said shaft terminating short of said holder and including an eccentrically mounted drive disc, and the rear end of said shaft adjustment to the rear end of said casing having flexible shaft coupling means;
(g) a flexible shaft coupled at one end to said coupling means and at its other end to said drive motor; and
(h) a lever element pivoted intermediate its ends in the forward portion of said casing for oscillating movement about an axis normal to the axis of said shaft, the rear end of said lever element terminating in a cavity receiving said eccentric disc so that rotation of said shaft will result in oscillating movement of said lever element by said disc, the forward end of said lever element terminating in a drive finger receivable in a clipper blade assembly when positioned in said clipper blade assembly holder to oscillate the movable blade teeth of the assembly relative to the stationary blade teeth

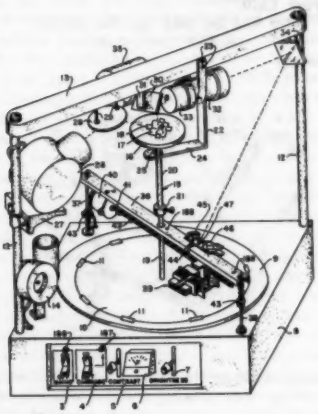
whereby said greater horsepower and rpm of said drive motor assures that the shear oscillation frequency of the movable blade teeth is maintained substantially constant under load, said greater horsepower also permitting a greater amplitude of oscillation to be used compared to the amplitude of oscillation of said prior art clipper and whereby the use of said flexible cable results in less heat being generated in said casing and provides for a lighter and more easily manipulated clipper compared to said prior art clipper.

4,531,292

FOODSTUFFS IMAGING PROCESS AND APPARATUS

Eliezer Pasternak, St. Louis, Mo., assignor to Joytronix, Inc., Santa Clara, Calif.

Filed Feb. 14, 1983, Ser. No. 466,060
Int. Cl.³ B43L *13/00*; A23G *3/28*
U.S. Cl. 33—18 R **20 Claims**



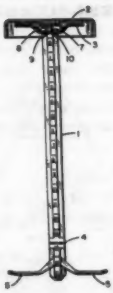
1. An apparatus incorporating integrated components for reproducing images onto relatively soft foodstuff, or the like, including inputting the image from a pictorial or other representation and processing it for transfer through scribing or related means onto such foodstuff, comprising, support means for the apparatus for supporting its various integrated components, foodstuff accommodating means included in said support means for handling of said foodstuff during image reproduction, input means scanning said pictorial representation and operatively associated with the apparatus for optically inputting of the pictorial representative source image, image processing means electrically connecting with the input means and provided for converting the optical images into electrical signals representative of the source image and for further processing of said electrical signals, means for imprinting the representative image onto the foodstuff, said imprinting means connecting with and responsive to said image processing means for imprinting of the representative image onto the foodstuff, and transfer means incorporated in said imprinter means and when actuated effecting scribing or other transfer of the representative image onto the foodstuff.

4,531,293

GAUGE FOR INDICATING QUANTITY OF MIXTURE COMPONENTS TO BE ADDED TO A TANK

James E. Grinde, 2401 - 147th La. NE., Anoka, Minn. 55303

Filed Feb. 3, 1984, Ser. No. 576,746
Int. Cl.³ G01F *23/04*
U.S. Cl. 33—126.7 R **8 Claims**



1. A gauge for use with a refillable tank of the type having a predetermined volume and having a tank filling opening closed by a removable cap, for determining the quantity of at least one mixture component to be added to a pre-existing quantity of mixture contained in said tank to ensure that the proper ratio of components is present when said tank is filled with another mixture component, comprising:
(a) a stick member having first and second ends, said stick being wettable and calibrated to indicate the amount of at least one of said components to be added to said tank prior to completing filling of the tank with the other of said components;
(b) said stick member having at least one foot member attached to said first end of said stick and projecting laterally outward therefrom to releasably retain said first end of said stick member within the tank and an attachment means at said second end of said stick member, said stick member being further divided into two portions joined together by hinging means disposed proximate said first end of said stick member; and
(c) means associated with said attachment means for suspending the stick member from said cap so that said cap serves as a handle for said stick, said hinging means allowing said cap to be displaced a sufficient distance from said

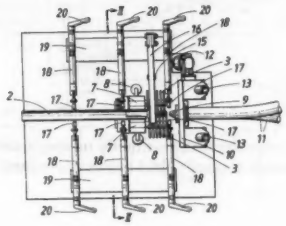
opening during filling of said tank without removing said first end of said stick member from said tank.

4,531,294

APPARATUS FOR MEASURING THE DIAMETER OF ROD-SHAPED WORK-PIECES

Wolfgang Lenz, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Oct. 6, 1983, Ser. No. 539,421
Claims priority, application Austria, Oct. 15, 1982, 3793/82
Int. Cl.³ G01B 5/00
U.S. Cl. 33—178 R **8 Claims**



1. An apparatus for measuring the diameter of a rod-shaped workpiece, comprising the combination of

(a) a workpiece rotating means for rotating the workpiece about an axis, the workpiece rotating means being comprised of

(1) two interdigitating pinion rolls driven in the same sense about respective axes extending parallel to the workpiece axis and arranged to engage said workpiece for centering and rotation of the workpiece about said axis, and

(2) means for pivoting the pinion rolls about a further axis extending parallel to the axes of the rolls for independently changing the distance between said axes,

(b) a workpiece feeding means including an inclined trough for feeding the workpiece to the pinion rolls for rotation,

(c) a stop engageable by the workpiece fed to the pinion rolls to define a predetermined axial position of the workpiece on the pinion rolls,

(d) a pressure-applying roller radially movable with respect to the workpiece axis into and out of engagement with said workpiece in said predetermined axial position, the roller being adapted to urge said workpiece against said pinion rolls when radially moved into engagement with said workpiece,

(e) workpiece diameter measuring means adapted to measure the diameter of the workpiece in said predetermined axial position, the measuring means including

(1) at least one pair of measuring gages spaced apart diametrically with respect to the workpiece axis, and

(2) gage-actuating means for moving the measuring gages in unison into and out of engagement with the workpiece in said predetermined axial position, and

(f) a workpiece discharging means for discharging said workpiece from said axial position upon disengagement of the pressure-applying roller and the measuring gages.

4,531,295

TIMING TOOL

Donald G. Saathoff, P.O. Box 632, White Swan, Wash. 98952

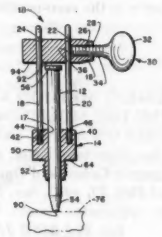
Filed Jan. 6, 1984, Ser. No. 568,832
Int. Cl.³ G01B 5/14; G01D 5/02
U.S. Cl. 33—180 AT **7 Claims**

1. A timing tool comprising in combination

means for slidingly mounting a piston follower rod having a flat upper end and a lower end in a spark plug opening of a cylinder with the lower end of the rod in contact with the top end of a piston and the upper flat end of the rod extending out of the cylinder;

said rod mounting means including a base having a threaded lower extension adapted to be received in a threaded spark plug opening and containing a central passage for slidingly receiving said piston follower rod, said rod being freely slidable downwardly into engagement with the top end of the piston and freely slidable upwardly;

gap means mounted above the flat upper end of the piston follower rod including a block having a flat lower surface parallel to flat upper end of the rod;



a sliding mount for slidingly mounting the block to move parallel to the upper end of the follower rod, including a plurality of guide rods extending from the base to the block; and

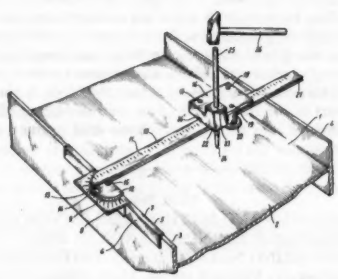
means associated with the sliding mounting means for locking the block in any selected position for indicating the position of the piston and the gap between the upper end of the piston follower rod and the lower surface of the locked block when the piston is moved away from top dead center.

4,531,296

DEVICE FOR MARKING OUT WORKPIECES

Christiaan E. Veeze, Ede, Netherlands, assignor to Sociaal Werkvoorzieningschap Zuidwest-Veluwe, Ede, Netherlands

PCT No. PCT/NL82/00019, § 371 Date Jan. 26, 1983, § 102(e) Date Jan. 26, 1983, PCT Pub. No. WO82/04217, PCT Pub. Date Dec. 9, 1982
PCT Filed Jun. 2, 1982, Ser. No. 463,888
Claims priority, application Netherlands, Jun. 2, 1981, 8102674
Int. Cl.³ G01B 5/14; B43L 13/02
U.S. Cl. 33—189 **4 Claims**



4. Device for marking out workpieces, said device comprising a sliding block provided with a vertical wall adapted to rest against the outer side of the workpiece, a graduated horizontal bar-shaped guider being secured with one end to the sliding block and extending laterally therefrom, the device further comprising a holder for a pin-shaped marking out member

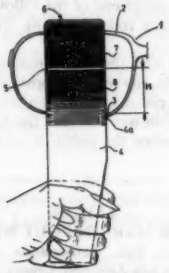
which is displaceable longitudinally of the bar-shaped guider from a starting position near said sliding block, corresponding to the zero-position of the graduation, said holder being provided with a vertical through bore for receiving said pin-shaped marking out member, said graduated horizontal bar-shaped guider being secured at the upper side of said sliding block and said vertical through bore for said pin-shaped marking out member being positioned in said holder so that in said starting position of said holder the axis of said bore is in the plane of the inner surface of the vertical wall of said sliding block, the bar-shaped guider secured to the sliding block being articulated about a vertical shaft in such a way that the axis of said shaft is coincident with the axis of the vertical bore of said holder if the latter is in the zero-position along said bar-shaped guider.

4,531,297

MEASUREMENT METHOD AND DEVICE FOR FACILITATING THE MOUNTING OF CORRECTIVE GLASSES ON A SPECTACLE FRAME

Jacques Stoerr, San Francisco, Calif., assignor to Essilor International (Compagnie Generale d'Optique), Creteil, France

Filed Oct. 27, 1983, Ser. No. 545,927
Claims priority, application France, Nov. 3, 1982, 82 18385
Int. Cl.³ A61B *3/10*
U.S. Cl. 33—200 **9 Claims**



1. A measurement device for mounting corrective glasses on a spectacle frame to verify the compatability of the lenses of said glasses with the frame and with the spectacle wearer and for the monocular measurement of the vertical position of the centers of the pupils of the eyes of the wearer with respect to the lower internal edge of the frame circles, said device comprising a transparent plate adaped to be placed before the eyes of a patient and provided with a graduated scale and a positioning marker, the center of said marker comprising the original reference of the graduated scale, the upper part of the transparent plate being in the shape of a blade and being opaque, the positioning marker comprising a transparent zone in the form of a slot disposed transversely across the blade in the opaque upper part of the transparent plate, said slot being adapted to be maintained in a substantially horizontal position during a measurement.

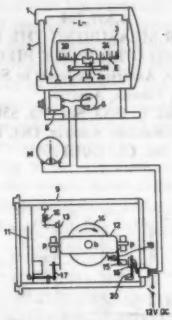
4,531,298

APPARATUS AND METHOD FOR CONTROLLING NORTHERLY TURNING ERROR IN DIRECTION INDICATING NAVIGATIONAL INSTRUMENTS

Francis West, Jr., Vineyard Haven, Mass., assignor to Robert S. Sanborn, Vineyard Haven, Mass., a part interest

Filed May 24, 1983, Ser. No. 497,425
Int. Cl.³ G01C *17/02*
U.S. Cl. 33—301 **18 Claims**

1. A navigational direction indicating device, useful for steering fast moving vehicles, of the type which includes means responsive to the earth's magnetic field, wherein the improvement comprises a rate of turn gyroscope, electric current producting means responsive to said rate of turn gyroscope and means responsive to said electric current producing



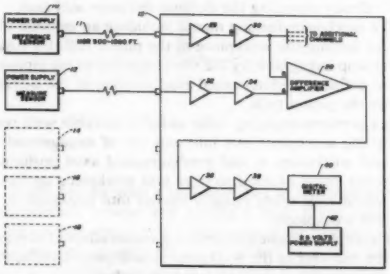
means operable to control northerly turning error occurring in the said earth's magnetic field responsive means.

4,531,299

ANALOG INCLINATION DATA SYSTEM

Lewis E. Wolfe, and Ross K. Howard, both of Ventura, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1984, Ser. No. 592,038
Int. Cl.³ G01C *9/06*
U.S. Cl. 33—366 **7 Claims**



2. In a device for taking roller path inclinations data as part of a weapon system and alignment sequence, the combination comprising:

a. first circuit sensing means including an accelerometer for generating an output signal proportional to the tilt of a reference plane;

b. second circuit means including an accelerometer for generating an output signal proportional to the tilt of an element of said weapon system;

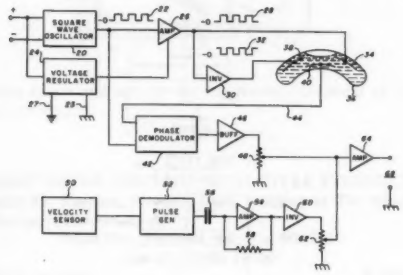
c. subtracting circuit means connected to said first and second circuit sensing means for subtracting said first generated signal from said second generated signal and providing an output signal that is proportional to the difference in tilt of said reference plane and said element of said weapon system; and

d. filter circuit means connected to the output of said subtracting circuit means for substantially removing the effects of the slow roll motion of the ship.

4,531,300
ELECTRONIC INCLINATION GAUGE WITH ACCELERATION COMPENSATION

Jeffrey C. Heidel, Phoenix, and Harold L. Swartz, Glendale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed May 7, 1984, Ser. No. 607,997
Int. Cl.[3] G01C 9/06
U.S. Cl. 33—366 16 Claims



1. Electronic inclination gauge for use in a moving vehicle subject to an acceleration, comprising:

a tilt sensitive transducer for providing an output corresponding to said acceleration and to the angle and direction of said transducer along a reference axis with respect to a gravitational field,

a velocity sensor driven by said vehicle for providing an output signal corresponding to a velocity component of said vehicle along said reference axis,

means coupled to receive said velocity output for deriving a signal representative of a component of said acceleration along said reference axis,

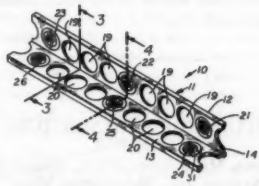
means for algebraically combining said acceleration signal component and said transducer output to provide a signal representative of the inclination of said reference axis with respect to said gravitational field, independent of said component of acceleration, and

means responsive to said combined signal to provide an output indicative of said inclination.

4,531,301
TWO-WAY LEVEL

Ralph Tau, R.D. #3, Saegertown, Pa. 16433

Filed Jul. 9, 1984, Ser. No. 628,794
Int. Cl.[3] G01C 9/28
U.S. Cl. 33—382 10 Claims



1. A level comprising a body having a first plate like leg and a second plate like leg integrally connected together at an apex and disposed at right angles to one another,

said first leg having a first outwardly extending rib on its outside of its distal end and said second leg having a second outwardly extending rib on its outside of its distal end,

said legs having a third rib attached to said legs on its outside of said apex,

said first rib having a first outwardly directed first working surface,

said first rib having a second outwardly directed working surface,

said third rib having a third working surface and a fourth working surface,

said third working surface and said fourth working surface being disposed at right angles to one another,

said second working surface being coplanar with a first plane passing through said third working surface,

said second working surface being coplanar with a second plane passing through said third working surface,

a plurality of first generally equally spaced holes in said first plate like leg,

a plurality of second generally equally spaced holes in said second plate like leg,

a first level vial in said first leg in one of said spaced holes,

a second level vial in said second leg in one of said spaced holes,

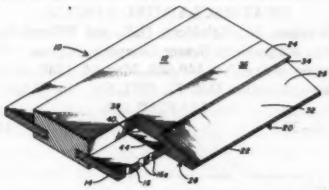
and means supporting said level vials in said first leg and in said second leg,

said legs and said ribs being of greater thickness than said means supporting said vial.

4,531,302
REPLACEMENT EDGE DRAFTING APPARATUS

Leon Tighe, 206 W. Squantum St., North Quincy, Mass. 02171

Continuation of Ser. No. 375,187, May 5, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 603,124
Int. Cl.[3] B43L 7/00
U.S. Cl. 33—483 5 Claims



1. In drafting rule apparatus having an elongated strip element with a damaged outer first drawing edge, an improvement providing a renewed drawing edge, said improvement comprising

A. an elongated body secured to said strip element and having an attachment section parallel to and side-by-side with a drawing section,

B. said drawing section having a planar frontmost surface extending along the thickness dimension of said section and forming a replacement drawing edge, and having a bottom surface extending along the width dimension of said drawing section and oriented transverse to said frontmost surface for facing a drawing surface over which the drafting rule may be placed,

C. said attachment section having an attachment surface disposed for mounting said body on the rule, said attachment surface extending along the width dimension of said attachment section and facing in the same direction as said bottom surface, and

D. adhesive means adhesively joining said attachment surface to said strip element for securing said body to the drafting rule,

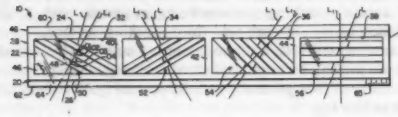
E. said attachment section further having a planar alignment surface parallel to said frontmost surface and facing oppositely thereto, said alignment surface being located intermediate said bottom surface and said attachment surface and being arranged for abutment against the drawing edge of the aforesaid rule to which said body is joined, so that said replacement drawing edge is aligned parallel to said damaged first drawing edge.

4,531,303

PRISMATIC STRAIGHTEDGE

Michael J. Jones, 1444 Burton Ave., Lutherville, Md. 21093

Filed Aug. 28, 1984, Ser. No. 645,347
Int. Cl.³ B43L *7/00*
U.S. Cl. 33—483 **14 Claims**



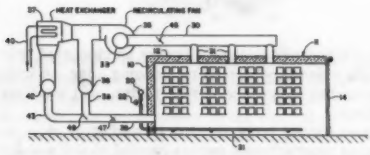
1. In a system of prism apparatus on a mount for use in orientation of lines and the like on a surface, as in drafting, by producing, in a field of view, an appearance of offset in a portion of a line when at oblique angles to the prism apparatus, the improvement comprising: the prism apparatus including a plurality of prisms having respective bases, the mount including a planar member with sides and ends and at least one of the sides comprising a straightedge, the plurality of prisms and the planar member being transparent, and the bases of the prisms being affixed in differing predetermined angular relations to the straightedge.

4,531,304

PRODUCTION OF CONCRETE ARTICLES UTILIZING HEAT-RECLAIMING SYSTEM

Billy J. Wauhop, Jr., Belvidere, N.J., and Willard W. Stratz, Bath, Pa., assignors to Besser Company, Alpena, Mich.

Continuation of Ser. No. 149,683, May 14, 1980, abandoned. This application Dec. 22, 1981, Ser. No. 333,622
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—30 **13 Claims**



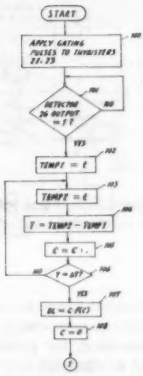
1. A method of reclaiming heat energy in the production of concrete articles produced by the steps of mixing together concrete aggregates and mixing water to form concrete; manufacturing concrete articles from the concrete; and curing the concrete articles in a kiln by allowing the concrete articles to pre-set during a pre-set period, heating up the pre-set concrete articles while maintaining the kiln atmosphere in a high humidity condition, maintaining the heated-up concrete articles at elevated temperature and high humidity during a soaking period, and then cooling down the heated and soaked concrete articles while in the kiln, the improvement comprising: reclaiming a portion of the heat energy from the kiln atmosphere by extracting heat energy therefrom after the concrete articles reach their maximum curing temperature by recirculating the kiln atmosphere in heat-exchange relationship with water so that the high temperature and high humidity kiln atmosphere gives up some of its heat energy to the water thereby heating up the water, and utilizing the reclaimed heat energy contained in the thusly heated water in the subsequent production of other concrete articles thereby lowering the total energy consumption required to cure the subsequently produced other concrete articles.

4,531,305

METHOD AND APPARATUS FOR CONTROLLING A CLOTHES DRYER

Kuniaki Nagayasu, Akashi; Setsuzou Konno, and Toshio Yoshida, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jun. 13, 1983, Ser. No. 503,553
Claims priority, application Japan, Jun. 17, 1982, 57-104919
Int. Cl.³ F26B *21/10*
U.S. Cl. 34—31 **11 Claims**



1. A method for controlling a clothes dryer having a rotary drum in which wet articles are dried, a fan located in an exhaust passage of the dryer for causing air to be drawn through an air intake passage into said drum and exhausted through said exhaust passage to the outside, a heater located in said air intake passage, an electrical resistance measurement means for measuring the electrical resistance of said articles, and a temperature measurement means for monitoring the temperature of said exhaust air in said exhaust passage, comprising the steps of:

(a) energizing said heater to increase the dryness of said articles;

(b) measuring said electrical resistance of said articles to detect when said electrical resistance reaches a predetermined value representative of a near 100% dryness;

(c) monitoring said exhaust air temperature;

(d) in response to said predetermined value of said electrical resistance, determining the rate of variation of said monitored exhaust air temperature with respect to time;

(e) estimating a time period of a duration based on said rate of variation of exhaust air temperature; and

(f) de-energizing said heater at the termination of said estimated time period.

4,531,306

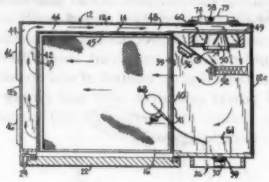
FOOD DEHYDRATOR WITH MOISTURE SENSING CONTROL

Chad S. Erickson, Maple Grove, Minn., assignor to Alternative Pioneering Systems, Inc., Bloomington, Minn.

Filed Jan. 6, 1983, Ser. No. 455,924
Int. Cl.³ F26B *21/10*
U.S. Cl. 34—44 **11 Claims**

1. A food dehydrator comprising an enclosed dehydrating zone, defined by wall means, said zone including a plurality of superimposed spaced shelves, means for moving an airstream through said enclosed zone, means for heating said airstream, moisture sensing means for sensing the moisture content within the product to be dehydrated so as to avoid invalid moisture

content readings due to premature drying of the outside surface of the product relative to the inside, means to disable said heating means and said air moving means dependent on said moisture sensing.

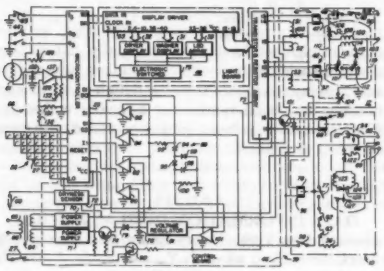


4,531,307

FABRIC DRYER CONTROL WITH CYCLE INTERRUPT

Pamela M. Kuecker, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1983, Ser. No. 565,732
Int. Cl.³ F26B *19/00*
U.S. Cl. 34—48 **8 Claims**



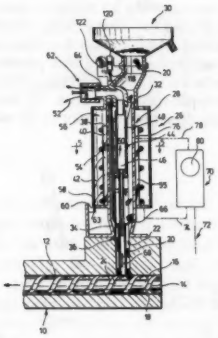
1. Fabric drying apparatus including a fabric tumbler and control circuitry operable for interrupting operation responsive to sensing temperatures outside a predetermined range, comprising: power supply means for energizing said fabric drying apparatus; heater means in airflow communication with said fabric tumbler for providing heated airflow to said fabric drying apparatus; cycle termination means for terminating operation of said fabric drying apparatus at completion of a selected cycle; temperature sensing means independent of said cycle termination means and generally associated with said fabric tumbler for detecting the temperature of airflow within said fabric tumbler, said temperature sensing means including thermostat means, thermistor means and oscillator circuit means operable for providing a frequency output representative of temperature signals variable in response to variations in airflow temperature; and control means including microcontroller means in communication with said temperature sensing means and power supply means, said microcontroller means being operable in a first circuit mode including said thermostat means, thermistor means and oscillator circuit means for limiting said fabric drying apparatus to operation within first predetermined temperature limits by monitoring the frequency output of said temperature sensing means for deenergizing said fabric drying apparatus and preventing reenergization thereof responsive to said temperature signals outside said first predetermined temperature limits, said microcontroller means being further operable in a second circuit mode including said thermistor means and oscillator circuit means for continuously monitoring the frequency output of said temperature sensing means for deenergizing said heater means responsive to said temperature signals outside a second predetermined temperature limit and operable for reenergizing said heater means responsive to said temperature signals within said second predetermined temperature limit.

4,531,308

APPARATUS FOR CONDITIONING HYGROSCOPIC PLASTIC MATERIAL

James R. Neilson, Toronto, and Robert R. Bishop, Agincourt, both of Canada, assignors to Cactus Machinery Inc., Markham, Canada

Filed Apr. 29, 1983, Ser. No. 490,239
Int. Cl.³ F26B *17/12*
U.S. Cl. 34—168 **13 Claims**



1. Apparatus for removing moisture from granules of plastic resin comprising a barrel with a peripheral wall which is vertically oriented in use and having means for receiving granular resin into an upper region thereof whereby such granular resin moves downwardly of said barrel under the influence of gravity, discharge means for discharging granular resin from a lower region of said barrel, a plurality of longitudinally extending spaced-apart means providing fin-like projections internally of and integrally with said barrel wall a plurality of spaced apart apertures in the barrel wall, channel means insertable lengthwise into said barrel to define a channel for permitting a flow of gases thereinto and therealong, said channel means being a perforated tube of an external dimension slightly less than the internal dimension defined by the extremities of the internally projecting fin-like means to permit insertion thereof and to locate thereby said tube centrally of said barrel, said fin-like means being a plurality of inwardly projecting fins, each of which extends substantially the length of the interior of the barrel wall, said fins being sufficiently spaced apart to permit downward passage of such granular resin between said fins, means for effecting a flow of gases for drying granular resin through the apertures in said barrel wall, over granules of resin in said barrel and into and along said channel means, said channel means being adapted to exhaust directly such gases away from such granular resin and outwardly of said channel means.

4,531,309

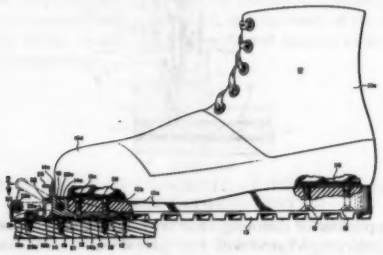
CROSS-COUNTRY SKI, SKI BOOT, AND BINDING COMBINATION AND BOOT AND BINDING COMPONENTS THEREOF

John H. Vandenberg, 20 N. Ridge Way, Sandy, Utah 84092, and Michael J. Mendenhall, 1063 W. Westfield Rd., Alpine, Utah 84003

Filed Sep. 13, 1982, Ser. No. 416,920
Int. Cl.³ A43B *5/04*; A63C *9/20*
U.S. Cl. 36—117 **17 Claims**

1. In combination, a caross-country type of ski boot, and a cross-country ski binding for attachment to the ski boot and to

a typically narrow, cross-country type of ski, the ski boot having a boot upper and a special thick sole approximating in width the width of the ski and recessed at the tip of the toe of the upper by a distance sufficient to provide a forward, transverse, under-toe recess for accommodating the forward portion of a toe-fitting as a part of the ski binding, which toe fitting is formed with a transverse, pivot-pin-receiving bore and is adapted to be received by the ski binding, and said sole having such a toe-fitting secured thereto, with its forward, pivot-pin-receiving portion received by said under-toe recess so that the pivot-pin-receiving bore is within said recess under said toe of the upper and rearwardly of the tip thereof; the ski binding also having, as a separate part thereof, a toe plate for attachment to the ski, with cheek plates rising therefrom at mutually opposite sides thereof and with registering holes in said cheek plates, respectively, for receiving an elongate pivot pin, the said forward portion of said toe fitting being adapted to be received between said cheek plates of said toe plate, with its said bore in registry with said holes in the cheek plates; an elongate pivot pin adapted to be fitted into said holes of the cheek plates and into said pivot-pin-receiving bore of the boot toe-fitting, thereby securely attaching the boot to the ski; means for latching said pivot pin in place in said cheek plate holes and said bore of the toe-fitting; resilient means adapted for attachment to the ski forwardly of said toe fitting and for selective adjustment into or out of abutting relationship with said toe fitting for substantially preventing pivotal movement of boot and ski relative to each other when in the air during a jump.



9. A cross-country ski binding, having a toe plate adapted to be secured to the upper surface of a cross-country ski with upstanding cheek plates at respectively opposite sides thereof for receiving a forward, transverse portion of a toe-fitting of a cross-country ski boot, said cheek plates being provided with mutually registering holes therein for registry with a transverse bore in the forward, transverse portion of the toe-fitting, and said ski binding having a pivot pin adapted to fit within the said registering holes of the cheek plates and the bore of the forward portion of the toe-fitting when such forward portion of the toe-fitting is received, said ski binding being characterized by the provision of resilient means adapted to be fastened to the ski forwardly of the toe-fitting of the boot and for selective adjustment into or out of abutting relationship with said toe fitting for substantially preventing pivotal movement of boot and ski relative to each other when in the air during a jump.

4,531,310

DISPLAY ELEMENT

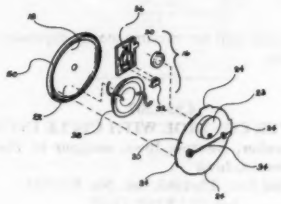
Paul Acson, Ft. Lauderdale, and Anthony Esposito, Coral Springs, both of Fla., assignors to Futures Unlimited, Inc., Ft. Lauderdale, Fla.

Filed Jan. 10, 1984, Ser. No. 569,756
Int. Cl.³ A44C *3/00*
U.S. Cl. 40—1.5 **12 Claims**

1. In a graphic and/or pictorial information communication device having audible enhancement of said graphic and/or pictorial information, the improvement comprising:

an information display member comprising an essentially rigid, substantially circular face member having a convex surface and a concave surface, said convex surface of said member having graphic and/or pictorial information associated therewith;

means for audible enhancement of said graphic and/or pictorial information comprising a sound synthesizer assembly for electronic sound reproduction, said assembly comprising a sound reproduction circuit, means having encoded message information for control of said circuit, a source of electrical power operative with said circuit and manual switching means for energizing said circuit with said source of electrical power;



means for projecting the electronic sound reproduction through said display element; and

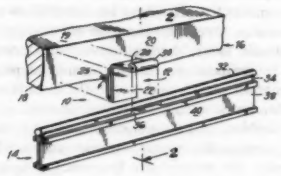
a backplate comprising an essentially rigid, substantially circular element having an essentially flat surface and means associated therewith for coupling with the back of said display member, thereby defining a chamber for housing the sound synthesizer assembly within said device, said backplate being further provided with means for fastening to apparel.

4,531,311

DATA INFORMATION DISPLAY DEVICE

Fred Howard, New York; Sydney Edson, East Meadow; Milton J. Merl, New City, all of N.Y., and Silvio J. Di Marchi, Wyckoff, N.J., assignors to Marlboro Marketing, Inc., New York, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,244
Int. Cl.³ G09F *3/18*
U.S. Cl. 40—10 R **9 Claims**



1. In combination with a shelf for displaying and dispensing products in a store environment, said shelf having a longitudinally extending front face;

bracket means;

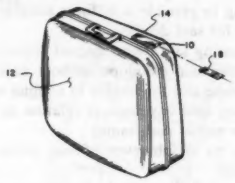
attaching means securing said bracket means to said shelf front face; and

an information carrying card mount including a rectangular plate section having front and rear faces and means for releasably engaging information bearing tickets onto said plate section front and rear faces to replacably retain said information bearing tickets in positions overlying said front and rear faces, said mount being coupled to said bracket and freely swingable about a longitudinal axis between opposite upwardly projecting and depending positions to provide selective alternative visual access to said tickets overlying said plate front and rear faces.

4,531,312
BAGGAGE CLAIM TICKET HOLDER

Raymond Stoddart, Middle Village, N.Y., assignor to Edward L. Gilkey, Maspeth, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,474
Int. Cl.[3] G09F 3/18
U.S. Cl. 40—10 D 1 Claim



1. A method of providing for identification and travel schedule of the user of an item of travel luggage to authorized personnel, while preventing disclosure of identification to others to whom the luggage may be visible utilizing a retainer comprising: A housing formed with a top wall and a bottom wall that bound a shaped internal chamber which is open at the front end of the housing, said chamber being of a size to substantially enclose and frictionally retain a baggage claim tag of the size of the standard size destination and claim check tag employed by airlines, said housing formed with a transparent top wall fabricated so as to expose to view the exterior marked surface of a baggage claim tag enclosed in the said chamber or alternatively to expose to view the interior surface of the bottom wall of the housing together with identification located on said bottom wall of a size and shape so as to be visible to view only when said claim tag is not enclosed in said chamber, said housing being fitted with means to fasten the said housing to the exterior of an item of luggage and said method comprising the following steps;

(a) registration with a service organization by the user of the indicia marked on his retainer unit so that the indicia serves as his coded identification with said service organization;

(b) Installation of the retainer unit on the exterior of an item of travel luggage by fastening the housing of the retainer to the exterior of the said item of luggage;

(c) Registration with said service organization of a travel plan and schedule of the user of the indicia together with authorization by the user to said service organization to permit the service organization to divulge the identification and schedules of the user to personnel of airlines and hotels upon receipt from the said personnel of identification information of said indicia as required;

(d) installation by the user, or by said personnel, of an airline baggage destination and claim check in the chamber of the retainer unit so as to conceal form view the indicia.

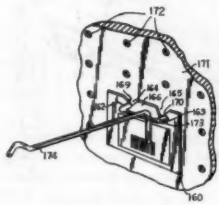
4,531,313
MERCHANDISE INFORMATION TAG WITH IMPROVED MOUNTING ARRANGEMENT

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 422,010, Sep. 23, 1982, which is a continuation-in-part of Ser. No. 358,925, Mar. 17, 1982.
This application Mar. 9, 1983, Ser. No. 473,650
Int. Cl.[3] G09F 3/18
U.S. Cl. 40—19.5 6 Claims

1. In combination:

a product identification tag comprising a substantially planar sheet of resiliently flexible plastic material having a mounting edge, said sheet including first and second transversely spaced mounting holes defined therein by respective first and second circumferential edges, said mounting holes each being slightly longitudinally spaced from said mounting edge, wherein said first and second mounting holes have respective first and second centers which are mutually spaced by a predetermined distance, said sheet further having first and second access cuts defined therein and extending from said mounting edge to said first and second circumferential edges, respectively, said access cuts each having respective mutually convergent first sides, wherein said first sides of said first and second access cuts, respectively, face away from one another and are transversely spaced along their entire lengths by less than said predetermined distance, wherein said first and



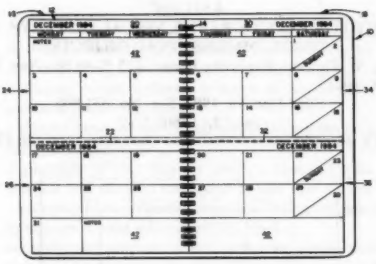
second access cuts intersect said first and second circumferential edges, respectively, at respective first and second access breaks in said first and second circumferential edges, respectively, and wherein said first and second access breaks are everywhere disposed transversely closer to one another than said predetermined distance; and

a support member having first and second legs which are spaced by said predetermined distance and having cross-sectional configurations which fit within said first and second mounting holes, respectively.

4,531,314
CALENDAR

Christopher A. Parent, West Springfield, and William R. Ferry, Feeding Hills, both of Mass., assignors to United Innovations div. of United Engineers, Inc., Holyoke, Mass.

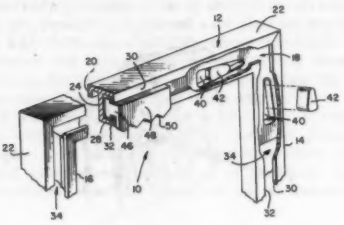
Filed Apr. 16, 1984, Ser. No. 600,900
Int. Cl.[3] G09B 3/04
U.S. Cl. 40—119 8 Claims



1. A calendar book having a plurality of pages hingedly connected to each other by a hinge means, each page bearing delineations corresponding to a part of a month and being subdivided into a plurality of segments each corresponding to a different portion of the month, the segments of a page being releasably secured to each other for ready separation from each other, each segment being separately hingedly connected to the book by the hinge means, all adapted and arranged whereby the segments of the pages may be selectively and successively separated from the plurality of pages as time ensues for continuously revealing the current date and the

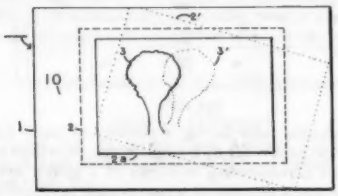
successive dates next-following beyond the dates of the next-to-be-overturned fragment.

4,531,315
BRACKET FOR PICTURE FRAME
David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022
Filed Aug. 31, 1984, Ser. No. 646,304
Int. Cl.³ A47G *1/06*
U.S. Cl. 40—155 **4 Claims**



1. A frame assembly comprising a plurality of mitred border members arranged to form a frame, each border member having a plurality of walls including side and rear walls including a channel defined at least in part by a said rear wall, said rear wall having a slot extending substantially the length thereof and opening into said channel, a plurality of corner brackets securing a different pair of border members together, each of said corner brackets comprising a member having a pair of angularly directed longitudinally extending legs, each leg having an enclosed aperture formed therein along the longitudinal extent thereof, a wedge inserted in each aperture and movable therealong to distend those portions of the aperture and the leg in the vicinity of said aperture outwardly into engagement with the inner surfaces of the side and rear walls defining said channel, each said enclosed aperture and wedge having a generally triangular shape, one leg of said bracket extending in length beyond said enclosed aperture and being integrally formed with a hanger element having means thereon to adjustably engage with a support to enable the frame to be selectively supported thereby.

4,531,316
FRAME FOR PHOTOGRAPHS, VISUAL DISPLAYS, AND THREE-DIMENSIONAL OBJECTS
Henry M. Farnum, Executive House, 225 E. 46 St., New York, N.Y. 10017
Filed Dec. 18, 1981, Ser. No. 331,965
Int. Cl.³ G09F *1/10*
U.S. Cl. 40—159 **20 Claims**



1. An improved envelope, said improvement selectively a protecting means for a photograph and similar visual displays, and a display of said photograph in said envelope used as a frame, and comprising:

said envelope with a front panel and a rear panel;

a cropping guide for cropping said display thru a cropped area in said front panel, said cropped area selected in relation to said cropping guide and removed from said front panel;

said cropped area, when uncropped, protecting said envelope from tearing or damage during any mailing, protecting, and storage of said photograph; and framing said photograph after said removal of said cropped area; and

said front panel and said rear panel; or said front panel, said rear panel, and a separate sheet with said cropping guide; cooperating to provide a stiffness suitable for rigidity in said frame for said display;

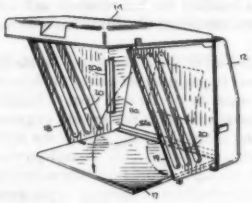
for constructing said frame for said display of said photograph from said envelope without additional cost for manufacture and for weight in mailing said frame;

for cropping said envelope in relation to said cropping guide for use as said frame;

for display to an observer of said photograph in said frame; and

for selectively mailing, displaying, protecting, and storing said photograph in said envelope.

4,531,317
PORTABLE VIEWING APPARATUS
Frederic McCurdy, Newburgh, N.Y., assignor to Graphic Technology, Inc., Newburgh, N.Y.
Filed Jun. 8, 1984, Ser. No. 618,534
Int. Cl.³ G09F *9/00*
U.S. Cl. 40—366 **8 Claims**



1. A portable apparatus for simultaneously viewing a transparency and a reflection copy image comprising:

a portable case having a body portion having sides and adapted to stand approximately vertically and having a cover portion pivotally coupled to said body portion near the top of said body portion for approximately horizontal disposition upon opening the case;

a pair of side light-shield means individually pivotally coupled to said sides of said body portion for moving outwardly from said body portion to an approximately vertical disposition extending from said sides of said body portion;

means pivotally coupled to said body portion near the bottom thereof for moving outwardly from said body portion for approximately horizontal disposition;

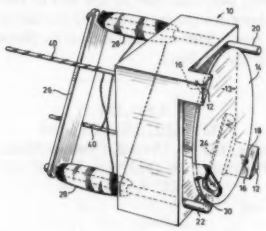
said body portion having a transparency-viewing portion including back-lighting means for illuminating a transparency when disposed therein from behind; and

said cover portion including lighting means for illuminating a reflection copy image when disposed on said approximately horizontally disposed means and for simultaneously illuminating the front of the transparency in said body portion.

4,531,318
DISPLAY OR INDICATING ELEMENT WITH BENT CORE

Kwangling Chang, Toronto, and Dalpat D. Mistry, Mississauga, both of Canada, assignors to NEI Canada Limited, Ontario, Canada

Filed Sep. 16, 1983, Ser. No. 532,771
Int. Cl.³ G09F 9/00
U.S. Cl. 40—449 **16 Claims**



1. Electromagnetically operated display or indicator element comprising:

a relatively thin disk defining a median plane and of contrastingly colored on opposite sides;

a housing rotatably mounting the disk for rotation about an axis adjacent and approximately parallel to said median plane,

the outline of said disk when viewed along its thickness dimension being approximately symmetrical about said axis of rotation,

a permanent magnet mounted on the body of and to rotate with said disk and defining a longitudinal and a magnetic axis both transverse with respect to said pivotal axis, and both generally parallel to the plane of said disk,

a pair of high remanence magnetic cores mounted on said housing and defining free ends located adjacent the edges of said disk when said disk is displaying either of its contrasting sides in the viewing direction,

at least one of said cores being bent adjacent its free end to define a tip extending transverse to the viewing direction and located to act as a stop for said disc on rotation in either direction theretowards whereby said bent core defines a first limiting position for rotation of said disk with said disk overlying said bent tip and displaying one side in the viewing direction and a second limiting position for rotation of said disk with said disk underlying said bent tip and displaying the other side in the viewing direction,

said cores being arranged relative to the locus of said permanent magnet so that with said free ends oppositely magnetized in one sense, said disk will be rotated from the first to the second limiting position; and with said free ends oppositely magnetized in the other sense, said disk will be rotated from the second to the first limiting position,

means for selectively magnetizing said cores in one of said opposing senses.

4,531,319
HANGING MOBILE GREETING CARD

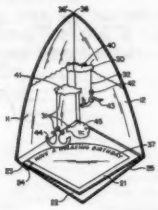
Ronald P. Saxton, 5019 N. High St., Columbus, Ohio 43214

Filed Nov. 8, 1984, Ser. No. 669,380
Int. Cl.³ G09F 1/08
U.S. Cl. 40—539 **12 Claims**

1. A foldable novelty and/or display device comprising:

(a) a planar card-like semirigid flexible material element including opposing side members hingedly connected along a bend line on a first axis with the bend line slitted on at least one end, each side member having a bend line on a second axis intersecting the first axis at a position juxtaposed to the internal end of the slit, to establish a base portion of each side member;

(b) the planar material being foldable on the first and second axes bend lines to overlap the base portions and establish



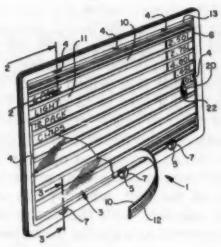
a unified foundation configuration, and to fold the side members into a position of angularly facing sides, the side members being fastened together to unify the facing sides at a position removed from the intersecting axes; and

(c) a display object suspended from the unified facing sides.

4,531,320
QUICK-CHANGE PLASTIC STRIP DISPLAY BOARD

Houston F. James, 8350 Moberly, Dallas, Tex. 75227

Filed Oct. 31, 1983, Ser. No. 547,043
Int. Cl.³ G09F 7/04
U.S. Cl. 40—621 **12 Claims**



1. A display assembly combination for mounting on a support and displaying a menu of items, comprising:

a. a display board defining a series of horizontal parallel recessed tracks thereon,

b. a second series of horizontal tracks within the confines of the first named tracks,

c. a plurality of thin flexible strips containing item names thereon and adapted to engage in said first named tracks,

d. a plurality of thin flexible magnetic source stripes adapted to engage in said second named tracks,

e. an additional plurality of much shorter thin flexible strips adapted to overlay and engage said first named flexible strips and containing item prices thereon,

f. a stripe of iron ink centrally located on the back side of each strip and running parallel to said strip for the length thereof,

g. means to conveniently install and remove each strip from its track, wherein said iron ink stripes coincide operationally with said magnetic stripe when all parts are installed, and

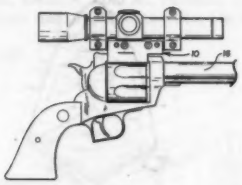
h. transparent cover means to overlay all said strips and all tracks,

i. and means in said display board assembly to quickly install and remove said cover means, and all item and price strips.

4,531,321
SCOPE-MOUNTING DEVICES FOR FIREARMS

Daniel L. Bechtel, P.O. Box 11281, Ft. Worth, Tex. 76109

Filed Jan. 12, 1983, Ser. No. 457,492
Int. Cl.[3] F41G 1/38
U.S. Cl. 42—1 ST 3 Claims



1. An apparatus adapted for mounting an auxiliary sighting device such as a scope on a firearm, and the firearm having a longitudinal barrel and a frame, comprising:

(a) a base having a pivotal axis, and the base being adapted to be mounted on the firearm so that the pivotal axis is generally perpendicular to the longitudinal axis of the barrel, and said base also having a longitudinal axis that is adapted to be oriented so that it is approximately parallel to the longitudinal axis of the barrel;

(b) bearing means for pivoting the base about its pivotal axis in order to foster adjustment in a vertical plane of the relative inclination of the base with respect to the barrel;

(c) means for adjusting the inclination of the base with respect to the barrel, and said means including a first vertical adjustment member in front of the pivotal axis and a second vertical adjustment member behind the pivotal axis;

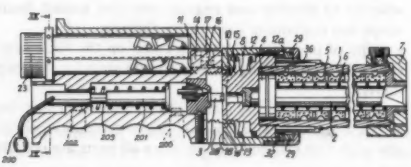
(d) structural means for rigidly connecting the base to the frame of the firearm when the base has a desired inclination with respect to the barrel, and said structural means including a pair of plates which are placed on opposite sides of a portion of the firearm frame, and further including at least one bolt which passes through the pair of plates in such a way as to permit pulling the plates together in order to rigidly capture a portion of the firearm frame between the plates, and wherein said at least one bolt also passes through an opening in the base, and the size of said base opening being appreciably larger than the diameter of the bolt, whereby the presence of the bolt does not interfere with the action of rotating the base about its pivotal axis during the adjustment thereof; and

(e) means for connecting an auxiliary sighting device to the base.

4,531,322
APPARATUS WITH MULTIPLE PROPULSION CHARGES FOR SLAUGHTERING ANIMALS

Pierre Termet, 16 Impasse Belloeuf, 69391 Lyon, France

Filed May 31, 1983, Ser. No. 499,493
Claims priority, application France, May 28, 1982, 82 09367; Apr. 29, 1983, 83 07150
Int. Cl.[3] A22B 3/02
U.S. Cl. 42—1 M 14 Claims

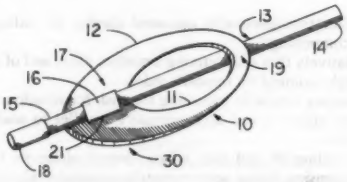


1. Apparatus having multiple propulsion charges and of the type in which a plunger is driven when the apparatus is fired comprising, a breech, a barrel having a cartridge chamber, a magazine connected to the breech for feeding cartridges into the cartridge chamber, means for locking the barrel to the breech for firing a cartridge in the chamber, means mounting said barrel on said breech for pivotal movement about a pivot axis parallel to and spaced from the axis of the barrel, from a first position in which the barrel is aligned with and can be locked to the breech, to a second position in which the barrel is aligned with the magazine to load a cartridge into the cartridge chamber, and wherein said barrel comprises, a threaded outer end, a bushing threaded on said end, a set screw threaded into the bushing perpendicular to the axis of the barrel, and a plastic insert between the set screw and the barrel threads, said plastic insert being deformed into the barrel threads to prevent unthreading of the bushing.

4,531,323
TOY GLIDER SYSTEM

Peter J. Henning, 183 W. Cornell, Pontiac, Mich. 48055

Filed May 23, 1983, Ser. No. 497,155
Int. Cl.[3] A63H 27/00
U.S. Cl. 446—66 7 Claims



1. An aerodynamic device comprising:

a planar member with an opening, a top surface and a bottom surface

an elongated fuselage passing through said opening obliquely with respect to the plane of said opening so that a bottom surface of a portion of said fuselage is positioned above said planar member top surface and so that a top surface of a further portion of said fuselage is positioned below said planar member bottom surface; and

means for accepting said fuselage attached to said planar member.

4,531,324
PLANT TISSUE CULTURE DEVICE

Ning-Sun Yang, Verona, and Alan Pasu, Middleton, both of Wis., assignors to Agracetus, Middleton, Wis.

Filed Oct. 7, 1983, Ser. No. 540,020
Int. Cl.[3] A01G 25/00
U.S. Cl. 47—81 5 Claims

1. A plant tissue culture device specifically adapted for use with plant calli and other plant tissue cultures generally without roots comprising

a medium vessel for holding a supply of liquid plant tissue culture medium therein;

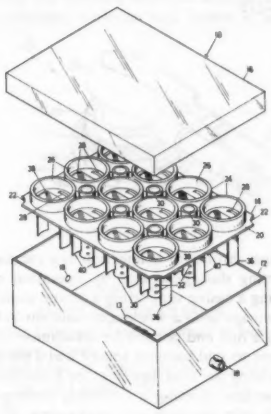
liquid inlet and outlet means for connecting the medium vessel to sources and drains of medium so that the level of the liquid medium can be changed to vary the distance between the liquid level and the culture plate or to add to, remove from, or exchange liquid medium;

a removable rigid culture plate mounted in and extending across the medium vessel above the level of the liquid medium therein, the culture plate provided with at least one access port in one of its corners to allow access to the medium in the medium vessel without removing the culture plate;

a plurality of upraised cylindrical culture wells formed on the top surface of the culture plate, the culture plate having at

least three openings formed extending therethrough in each of the culture wells, at least two of the openings located generally on opposite sides of the culture well; and

an elongated filter paper wick for each culture well formed of flat, planar, non-rigid porous fibrous material, the wick folded to form a central culture host portion overlying and resting for physical support on the top of the culture plate in the culture well and also folded to form legs to extend downwardly through the two opposite of the openings to depend into liquid medium in the medium vessel so that liquid medium will be transported by capillary action to the culture host portion of the wick upon which a tissue culture can be directly placed in each culture well, the other opening in the culture plate in each culture well allowing excess liquid medium in the culture well to drain back into the medium vessel.

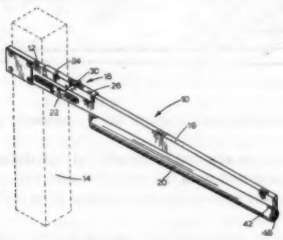


4,531,325

HINGED VEHICLE GATE ARM

David A. Phillips, 1055 6th Ave., Des Moines, Iowa 50314

Filed May 7, 1984, Ser. No. 607,710
Int. Cl.³ E01F *13/00*
U.S. Cl. 49—49 8 Claims



1. A vehicle gate arm for attachment to an automatic vehicle gate operating mechanism for raising and lowering the vehicle gate arm to regulate vehicular traffic, the vehicle gate arm comprising:

(a) an elongate arm attached to the gate operating mechanism; and

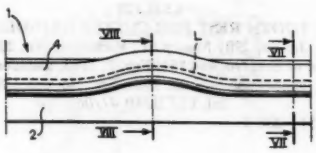
(b) a padded roller mounted for rotation longitudinally below said elongate arm for preventing damage to a vehicle beneath said elongate arm lowered by the gate operating mechanism.

4,531,326

EXTRUDED WEATHER STRIP FOR MOTOR VEHICLE BODIES AND AN EXTRUSION HEAD FOR FORMING THE WEATHER STRIP

Guido Ballocca, and Roberto Azzola, both of Turin, Italy, assignors to S.A.I.A.G. S.p.A., Italy

Filed Jan. 6, 1984, Ser. No. 568,566
Claims priority, application Italy, Jan. 6, 1983, 67009 A/83
Int. Cl.³ E06B *7/16;* B28B *21/52*
U.S. Cl. 49—497 4 Claims



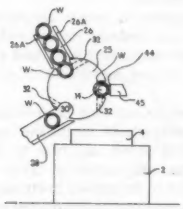
1. A weather strip for the edge of an aperture of the body of a motor vehicle or for the edge of a closure element of such an aperture, the weather strip comprising an anchoring section of elastomeric material and a tubular sealing section of elastomeric material coextruded with the anchoring section, the edge having critical zones for the application of the weather strip, such as, for example, corner portions or portions adjacent to which there is an obstacle: the tubular sealing section, in the portions of the strip intended to be applied to the critical zones of the edge, being curved relative to the anchoring section and connected to the anchoring section along a curved line.

4,531,327

CENTERLESS GRINDING MACHINE WITH FERRIS WHEEL ARRANGEMENT

Victor F. Dzewaltowski, and Lawrence I. Millay, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 25, 1983, Ser. No. 488,239
Int. Cl.³ B24B *5/32, 5/40*
U.S. Cl. 51—103 WH 7 Claims



1. In a centerless grinding machine for grinding the inner surface of a cylindrical, tubular workpiece concentric with the outer surface, the combination of a rotatable ferris wheel means having multiple, circumferentially-spaced, workpiece-receiving pockets, a workpiece feed means at a first loading position adjacent the circumference of said ferris wheel means, a stationary workpiece alignment shoe means at a second grinding position adjacent the outer circumference of said ferris wheel means and a workpiece discharge means at a third unloading position adjacent the circumference of said ferris wheel means, indexer means for incrementally rotating said ferris wheel means to place each pocket thereof successively at the loading, grinding and unloading position, said ferris wheel means having workpiece alignment shoe means located in each of said pockets such that said stationary shoe means and the respective pocket shoe means support and align the outer workpiece surface when the respective pocket is at the grind-

ing position and retain the workpiece substantially inside said respective pocket at the grinding position, a grinding wheel means on one side of said ferris wheel means movable axially inside the workpiece in said pocket in the grinding position and movable radially outward toward said stationary shoe means into engagement with the inner workpiece surface to grind said inner surface while said outer surface is aligned by said stationary shoe means and pocket shoe means, and a workpiece driver means on the other side of said ferris wheel means for rotating the workpiece in the pocket in the grinding position.

4,531,328

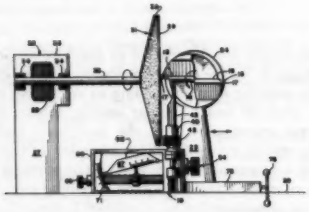
TOOTH REST FOR CUTTER GRINDER

Bryce D. Jewett, 2901 Maury St., Richmond, Va. 23224

Division of Ser. No. 464,151, Feb. 7, 1983, abandoned. This application Sep. 28, 1984, Ser. No. 655,238

Int. Cl.[3] **B24B** *41/06*

U.S. Cl. 51—238 T **3 Claims**



1. Apparatus for positioning a milling tool having a number of cutting edges in a circular cylindrical array, said apparatus being comprised of

(a) a housing having a substantially flat base adapted for mounting to a horizontal support surface, and first and second side extremities,

(b) a channel disposed perpendicularly to said base adjacent said first side extremity,

(c) elongated pedestal means slideably engaged by said channel,

(d) an elongated abutment finger extending upwardly from said pedestal means,

(e) threaded adjustment means adapted to cause vertical movement of said pedestal means within said channel,

(f) locking means associated with said channel adapted to controllably prevent movement of said pedestal means, and

(g) selector means comprising (1) a threaded rod rotatably journaled to said pedestal means and extending perpendicularly therefrom above said base to slotted engagement with said second side extremity, (2) an upwardly directed pointer adapted to be moved horizontally in response to rotational movement of said threaded rod, (3) a lever scale pivotably mounted above said threaded rod and having a straight lower edge adapted to rest by gravitational force upon said pointer, said lever scale having a pointed free extremity and a series of uniformly spaced markings representing linear distance corresponding to the diameters of milling tools to be sharpened, and (4) a stationary scale of markings corresponding to degrees of angle of a cutting edge, said scale being associated with said second side extremity and positioned adjacent the pointed free extremity of said lever scale, whereby

(h) when the horizontal position of the pointer is adjusted so as to reside under that site of the lever scale representing the diameter of the milling tool to be sharpened, vertical adjustment of the pedestal, with attendant vertical movement of said pointer and finger causes the pointed free extremity of said lever scale to indicate the sought angle of sharpening on said stationary scale and causes the elevation of the abutment finger to be exactly appropriate to support said milling tool for securement of the sought angle of sharpening of said cutting edges.

4,531,329

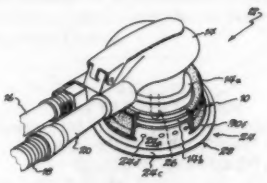
LIP SEAL SHROUD

Paul W. Huber, Lancaster, N.Y., assignor to Dynabrade, Inc., Tonawanda, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,505

Int. Cl.[3] **B24B** *55/06*

U.S. Cl. 51—273 **14 Claims**



1. An exhaust shroud for connection to a vacuum source for use in collecting dust generated by operation of a sanding machine having a casing supporting a driven member intended to operably engage with a workpiece, said shroud comprising a skirt having a first end portion for attachment to said casing and connection to said vacuum source and a second end portion for providing an inlet opening for collecting dust, said second end portion defining a resiliently deformable lip surrounding said inlet opening and terminating in a free edge positioned to engage with a surface of one of said driven member and said workpiece outwardly of said driven member, when said driven member is operably engaged with said workpiece, and said lip is configured to position said free edge relatively inwardly of the juncture of an opposite end of said lip with said second end portion.

4,531,330

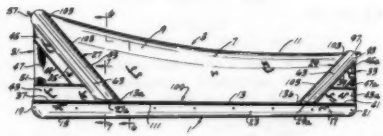
BED/SHELTER UNIT

William E. Phillips, 6015 Varna Ave., Van Nuys, Calif. 91401

Filed Feb. 1, 1982, Ser. No. 344,748

Int. Cl.[3] **A47C** *27/08;* **A45F** *1/02, 1/00*

U.S. Cl. 52—2 **25 Claims**



1. A bed/shelter unit adapted to be compactly packed comprising:

an air mattress adapted to be inflated and deflated;

A tent associated with the mattress, said tent adapted to be erected as a shelter over the mattress and to be collapsed on the mattress;

said mattress, when deflated, and said tent, when collapsed on the mattress, being adapted to be compactly packed as by rolling them up into a bundle;

said tent including a panel of flexible tent material adapted to arch over the inflated mattress from one side of the mattress to the other;

said panel having lower side edges secured to the mattress at the sides of the mattress;

said lower side edges of said panel terminating short of the ends of the mattress so that the mattress has end portions at both its ends extending beyond said lower edges;

said panel having support means at each end adjacent each

end of the mattress, each said support means adapted to be erected as an arch extending over the mattress from one side of the mattress to the other with each arch, at its lower ends, being spaced inwardly from its adjacent end of the mattress and sloping upwardly away from each other; and

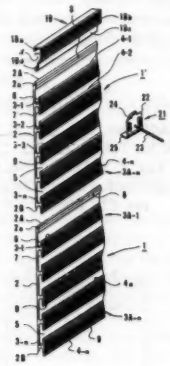
means extending between each said arch and its adjacent end portion of the mattress for holding each arch in an erected position with the panel drawn between the arches and arched over the inflated mattress without any support member extending between said arches to support said tent.

4,531,331

DISPLAY APPARATUS

Takafumi Itagaki, Urayasu, Japan, assignor to Tamatoshi Industries Ltd., Tokyo, Japan

Filed May 27, 1983, Ser. No. 498,784
Int. Cl.³ E04B *1/00*; G09F *7/18*
U.S. Cl. 52—38 **10 Claims**



1. An apparatus for displaying articles comprising:

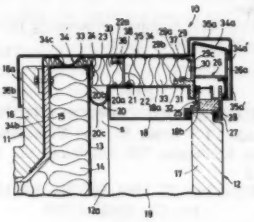
first and second modular panels joined together and fastened to a support wall, each panel having (1) a back wall, (2) a plurality of ribs extending outwardly from said back wall at separated intervals, (3) a plurality of flanges each extending from the other end of each of said ribs to form surfaces parallel to said back wall and coplanar with the surfaces of the other flanges, and to form channels between said back wall and adjacent flanges, (4) a lower extension of said back wall (5) an upper extension of said back wall extending beyond the uppermost flange, having a furrow for receiving the lower extension of another panel and having an indentation for indicating positions of bores for driving a fastening means through said upper extension to fasten said panel to said wall, the lowermost flange of said another panel covering said fastening means when the lower extension thereof is received by said furrow and, at least one hook element for receiving articles to be displayed, means slidably supporting said hook element on one of said flanges.

4,531,332

ROOFTOP PARAPET FOR THERMALLY-INSULATED CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,495
Claims priority, application Japan, Jul. 21, 1982, 57-110379[U]
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—58 **6 Claims**



1. A rooftop parapet for a thermally-insulated-curtain-walled building, comprising:

(a) a parapet base;

(b) a thermally-insulated curtain wall having an upper part spaced apart from said parapet base with a gap therebetween;

(c) a moisture-proof sheet covering said gap;

(d) a thermally insulating material laid over an upper edge of said parapet base, said moisture-proof sheet, and an upper edge of said curtain wall;

(e) a waterproof sheet superposed over said insulating material; and

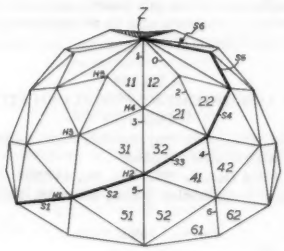
(f) a coping plate superposed over said waterproof sheet.

4,531,333

HELICAL DOME

Charles W. Huegy, 2 Mann St., Irvine, Calif. 92715

Filed Dec. 20, 1982, Ser. No. 433,454
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—81 **2 Claims**



1. A geodesic dome structure comprising:

a. a joint pattern based on a variant of the helix formula: $Z=b'\theta$, where Z is a dependent variable perpendicular height from the base of the dome to a point on the dome's surface directly above, where b' is a parameter which can take on any list of values and not a constant; where θ is an independent variable for the angle between the abscissa and a vector from the center of the dome to the base of a perpendicular and the use of the theorem of Pythagoras: $a'=\sqrt{r^2-Z^2}$ where a' is a dependent variable for the vector from the center of the dome to the base of a perpendicular; where r is the radius of the dome; where Z is

the height of a perpendicular from the base to a point on the dome's surface, and where as successive values are taken on by the independent variable θ the corresponding values for Z and a' are determined for each joint, and where smaller values may be selected for b' in order to pull joints back from the zenith to relieve a tendency they have of crowding together at the top,

b. a set of structural members spiraling from joint to joint along a helical path from base to zenith,

c. a set of structural members proceeding from joint to joint from base to zenith along a path on a plane perpendicular to the base,

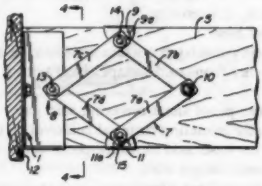
d. a set of structural members proceeding from joint to joint along paths parallel to the base.

4,531,334

EARTHQUAKE-PROOF CONSTRUCTION BRACKET

Eric F. Nylander, 179 Arbor St., San Francisco, Calif. 94131, and Thomas E. Fourre, 729 Edinburgh St., San Francisco, Calif. 94112

Filed Jun. 27, 1983, Ser. No. 508,136
Int. Cl.³ E04H *12/18*
U.S. Cl. 52—109 **6 Claims**



1. Apparatus for securing one end of a beam to a structure, the securing apparatus comprising:

(a) two ended link means,

(b) first means for pivotably attaching one end of the link means to the beam at a point distal from the structure,

(c) second means for pivotably attaching the other end of the link means to the structure, and

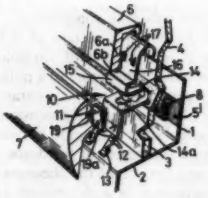
(d) wherein the link means includes compression means intermediate its ends for supplying a compressing force to the beam across its width at a point intermediate the pivotal attachments when the distance between the pivotal attachments is increased due to relative motion between the beam and the structure.

4,531,335

CLIP AND ARRANGEMENT FOR FLUSH FITTING OF WINDOWS

Denis Mangan, 48 Mendip Way, Sundon Park, Luton, Bedfordshire LU3 3JL, United Kingdom

Filed Dec. 8, 1982, Ser. No. 447,961
Claims priority, application United Kingdom, Dec. 22, 1981, 8138478
Int. Cl.³ E06B *3/00*
U.S. Cl. 52—208 **8 Claims**



1. A resilient fixing clip for use in applying a glass to a flange window aperture comprising an elongate narrow strip of resilient material which is bent, or otherwise formed, to provide a channel part at one end for fitting over an edge of the glass to be fitted with opposite sides of the channel bearing on opposite faces of the glass, catch means at the other end in the form of an appropriately shaped tongue part for latching onto a flange around said window aperture, and an intermediate section which is shaped with a configured section such that it will deform and allow elongation between one end and the other end of the clip in response to an applied pressure, the resilience of the material being sufficient to ensure that the clip will tend to be restored to its original shape when the applied pressure is removed.

8. A flush glass system of the kind in which a glass is retained by sealant within a flanged window aperture, characterised by the glass having a number of resilient fixing clips located at spaced positions around its periphery, which clips act to retain the glass positively in the window aperture by locking behind the flange and pressing the glass down against sealant which is applied to the face of the flange each clip comprising

(a) a portion for clamping onto the edge of the glass sheet

(b) a portion for latching onto the backside of the flange, and

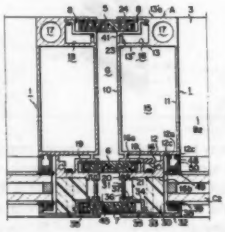
(c) a resilient elongation comprising an elongated narrow strip section between the edge engaging portion and the latching portion, said resilient portion having a configured section which will deform, when compressed between the front face of the flange and the back face of the glass, will elongate between one end and the other serving to move the latch portion away from the glass edge and over the edge of the flange, the resiliency of the elongated section permitting the elongation section to tend to return to its original shape upon removal of compressive force applied against the glass thereby pulling the latch portion into holding engagement with the back side of the flange adjacent the edge of the flange.

4,531,336

MULLION PORTION IN A UNIT TYPE CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,201
Claims priority, application Japan, Aug. 10, 1982, 57-121496
Int. Cl.³ E06B *7/14*
U.S. Cl. 52—209 **5 Claims**



1. A unit type curtain wall assembly composed of a plurality of standardized curtain wall units, each curtain wall unit having a top and a bottom frame members and a pair of side frame members joined into a rectangular shape, with at least one fluid passageway extending longitudinally through each frame member, there being a gap between the opposed side frame members of every two horizontally adjoining curtain wall units, wherein the improvement comprises:

(a) an indoor sealing band connected between the opposed side frame members of every two horizontally adjoining curtain wall units to close the gap to flow therebetween on the indoor side thereof;

(b) a first outdoor sealing band connected between the op-

posed side frame members of every two horizontally adjoining curtain wall units to close the gap to flow therebetween on the outdoor side thereof; and

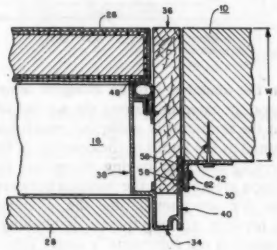
(c) a second outdoor sealing band connected substantially between the opposed side frame members of every two horizontally adjoining curtain wall units and disposed exteriorly of the first outdoor sealing band to provide a space closed to flow between the first and second outdoor sealing bands.

4,531,337

DOOR CASEMENT

Joseph W. Holdiman, 1095 Arrowhead Dr., Dubuque, Iowa 52001

Filed Feb. 18, 1983, Ser. No. 468,046
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—217 **5 Claims**



1. A door assembly of adjustable width for insertion into a door opening in a wall of selected thickness having inner and outer surfaces, comprising:

a metal outer frame having a front face and inner and outer surfaces;

a wooden inner frame member coupled to said metal outer frame and having a rear surface, said rear surface of said wooden frame member being substantially coo-planar with the inner surface of said wall;

rib means disposed around the outer surface of said metal outer frame for receiving a nailing fin;

a nailing fin having tongue means to be received within said rib means, said rib means and said tongue means cooperating to provide an adjustable distance between said nailing fin and said front face; and

fastener means extending through said nailing fin and into said wooden inner frame member for capturing said tongue means within said rib means.

4,531,338

BUILDING WALL PANEL

Norman L. Donatt, Bellevue, Wash., assignor to Olympian Stone Company, Redmond, Wash.

Filed Jun. 15, 1983, Ser. No. 504,390
Int. Cl.³ E04B *2/28*
U.S. Cl. 52—235 **22 Claims**

1. A preformed building wall panel for mounting on a building frame structure, comprising:

a. at least one masonry panel having:

an outer surface and a back surface; and

a plurality of pairs of blind holes extending through the back surface and extending partially through said masonry panel;

b. a support frame for supporting said masonry panel;

c. first attachment means having leg members snugly engaged within said pairs of blind holes formed in said masonry panel said first attachment means extending rearwardly from the back surface of said masonry panel to form a bight that is open in the direction facing the back surface of said masonry panel;

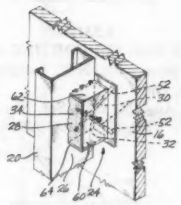
d. means for forming an individual pocket associated with and surrounding each of said first attachment means, each of said pocket forming means being secured to said mounting frame;

e. second attachment means extending through a corresponding pocket at a location between the bight portion of said first attachment means and the back surface of said masonry panel; and,

f. bonding medium disposed within and filling said pockets to securely anchor the bight portion of each first attachment means within its corresponding pocket.

19. A method of forming a building panel from a plurality of relatively thin facing panels of masonry material, such as granite or marble, comprising the steps of:

a. forming a plurality of pairs of blind holes in the back surfaces of said facing panels;



b. placing the facing panels face down on a support;

c. snugly engaging the leg portions of first attachment means into the blind holes of said facing panels to extend rearwardly and define a bight that is open in a direction facing the backsides of the masonry panels;

d. forming a supporting frame with a plurality of spaced-apart pockets, an individual pocket being associated with each of said first attachment means;

e. placing said backing frame on the backsides of said facing panels so that each of said first attachment means extends rearwardly into a corresponding individual pocket;

f. engaging second attachment means with a corresponding pocket to extend through said pocket at a location between the bight of said first attachment means and the rear surface of a corresponding masonry panel; and,

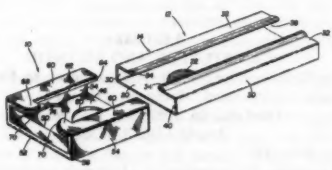
g. filling said pockets with a bonding medium thereby to rigidly attach said masonry panels to said support frame.

4,531,339

CHANNEL END CAP

Walter Tomaszewski, Canton, and James H. C. Yang, Cleveland, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1984, Ser. No. 603,256
Int. Cl.³ E04F *19/00*
U.S. Cl. 52—716 **16 Claims**



1. The combination of an end cap physically secured to an end portion of a channel member and covering the axial outer end surface thereof, said channel member being of generally

rectangular form, in transverse cross section, having a substantially flat bottom wall, similarly projecting side walls, and top walls parallel to said bottom wall, said top walls having contoured inner edges separated by a continuous central longitudinal slot, said end cap being comprised of a flexible resilient material of a generally rectangular form, in transverse cross section, and of a predetermined axial extent having:

(a) first bottom and side wall portions enveloping the corresponding adjacent walls of said channel member, said end cap also having first top wall portions enveloping at least the transverse outermost portions of said channel member top walls;

(b) second bottom, side and top wall portions extending respectively, from said corresponding first wall portions, axially outwardly of said channel member axial outer end surface; and

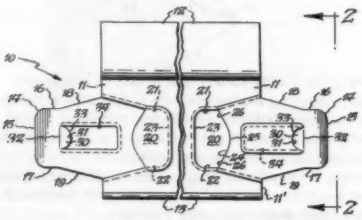
(c) abutment means intermediate said first and second wall portions acting as stop means and abutting said channel member axial outer end surface.

4,531,340

BEAM SPLICE FOR SUPPORTING GRID SYSTEMS

Gale E. Sauer, Williamsville, N.Y., assignor to Donn Incorporated, Westlake, Ohio

Filed Aug. 24, 1982, Ser. No. 411,043
Int. Cl.³ E04C *3/04*
U.S. Cl. 52—726 **9 Claims**



1. In a beam member for use with a suspended ceiling system for retaining removable panel sections, said beam member including a longitudinally extending, upstanding web portion, a transverse flange extending outwardly from a lower edge of said web portion to peripherally support said panel sections, the improvement comprising a tongue which extends longitudinally outwardly from an end of said web portion and integral therewith, said tongue having a laterally offset detent provided with an inwardly extending curved leading edge, the center of curvature for said curved leading edge lying longitudinally outwardly of said leading edge, and the web portion being provided with an abutment wall spaced longitudinally inwardly of said tongue, said abutment wall having a curved central portion and vertically spaced apart diverging sidewalls, the center of curvature for said curved central portion lying longitudinally inwardly of said central portion, said curved central portion being capable of receiving in nesting relationship the curved leading edge of a detent of another beam member when disposed in end to end relation.

4,531,341

CAN STUFFER AND METHOD

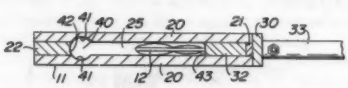
Norman Bittner, Cherry Hill, N.J., assignor to Enviro-Spray Systems Incorporated, Montgomeryville, Pa.

Filed Jul. 16, 1982, Ser. No. 398,887
Int. Cl.³ B65B *63/04*
U.S. Cl. 53—117 **5 Claims**

1. Apparatus for inserting an elongated expandable pouch into an aerosol-type container having therein a liquid product to be dispensed on demand and including a top opening substantially smaller than the width of the container and of the type wherein the expandable pouch includes separately compartmented internal gas generating components which expands said pouch to pressurize the container after it has been inserted therein, comprising:

a receiving chamber disposed between two substantially parallel plates and first and second opposing ends for receiving said elongated expandable pouch with its width parallel to said plates in a substantially vertical and unexpanded condition, said elongated pouch in the substantially unexpanded condition having a width substantially greater than the width of said opening of said container into which said elongated pouch is to be inserted;

pusher means mounted in said chamber between said plates and extending along said first end thereof, said pusher means being movable parallel to said plates between a first position adjacent said first end and a second position adjacent a second end, for deforming the expandable



pouch in the chamber into an elongate temporarily collapsed product extending along the second chamber end, such that the temporarily collapsed pouch has a width at least as small as the width of the opening of the container, said receiving chamber having along said second end a cross section greater than the distance between said parallel plates for accommodating the elongate collapsed pouch to prevent crushing thereof and having a cross-sectional dimension not substantially larger than the opening in said container; and

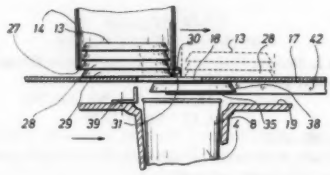
ejector means, movable in said chamber along said second end in a direction perpendicular to the direction of movement of said pusher for ejection of the temporarily collapsed pouch into a container disposed below said chamber at said second edge thereby allowing said pouch to expand within said container to pressurize and propel the product to be dispensed.

4,531,342

CUP DISPENSER FOR CUPS CONTAINING FRESHLY MADE BEVERAGES

Poul E. Wittenborg, Odense, Denmark, assignor to Wittenborgs Automatfabriker A/S, Odense, Denmark

Filed Sep. 9, 1982, Ser. No. 416,431
Claims priority, application Denmark, Oct. 2, 1981, 4383/81
Int. Cl.³ B65B *7/28;* **B67B** *3/22*
U.S. Cl. 53—308 **11 Claims**



1. A cup dispenser for cups containing freshly made beverages, said dispenser comprising a discharge opening forming a connection between an interior of the dispenser and a dispensing chamber, from which a filled cup being removed, the dispenser having a rotor pivotably mounted about a vertical shaft and having a peripheral wall extending in axial direction and co-operating with the discharge opening from the interior in such a manner that said discharge opening is completely closed by part of the peripheral wall in any position of the

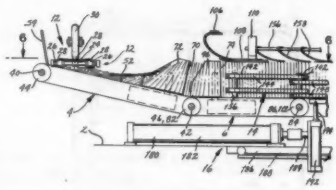
rotor apart from the position in which a cup chamber shaped on said rotor opposes the discharge opening, said cup chamber forming a recess in the peripheral wall.

4,531,343

MACHINE AND PROCESS FOR STACKING AND BUNDLING FLEXIBLE SHEET MATERIAL

James R. Wood, Salem, Ill., assignor to World Color Press, Inc., Effingham, Ill.

Filed Oct. 14, 1981, Ser. No. 311,348
Int. Cl.³ B65B *13/20*
U.S. Cl. 53—399 **39 Claims**



30. A process for arranging flexible sheets in a stacked condition, said process comprising: depositing the sheets on a moving conveying surface and moving the conveyor surface such that the sheets are formed and advanced in a shingled condition in which the leading edge of any one of the shingled sheets overlies the sheet immediately ahead of it and the trailing edge is at the conveying surface, the shingled sheets further having major surface areas which face primarily toward the conveying surface; moving the shingled sheets while on the conveying surface toward a space between spaced apart deflecting surfaces which project upwardly with respect to the conveying surface to an elevation that is with respect to the conveying surface greater than the elevation of the leading edges of the shingled sheets, the deflecting surfaces being at least in part oblique relative to each other, with the smallest distance between the deflecting surfaces being less than the width of the sheets; moving the shingled sheets while they are on the conveying surface through the space between the deflecting surfaces such that the sheets bow forwardly on the conveying surface and simultaneously rise at their leading edges, so that the sheets upon passing through the space between the deflecting surfaces assume an edge-standing condition on the conveying surface, whereby the sheets assume a generally stacked condition in which the succession sheets, by reason of the preceding shingled arrangement, is less than fully consolidated.

4,531,344

DEVICE FOR ALIGNING AND BANDING A PILE OF PAPER SHEETS

Koji Sato, Hiratsuka, and Hikaru Kawano, Odawara, both of Japan, assignors to Musashi Co., Ltd., Tokyo and Hitachi Denshi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 13, 1982, Ser. No. 449,169
Claims priority, application Japan, Dec. 19, 1981, 56-205866
Int. Cl.³ B65B *35/50, 13/12*
U.S. Cl. 53—447 **7 Claims**

1. A device for aligning and banding stacked paper sheets comprising:

a hopper adapted for holding paper sheets in a stacked state;

a separating drum for separating the paper sheets and feeding them one at a time in generally horizontally oriented condition;

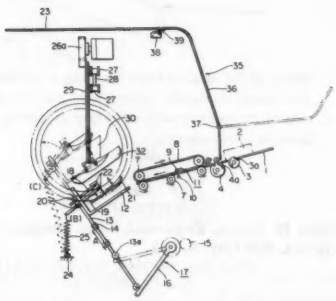
a generally horizontal supply belt having a receiving end for receiving the paper sheets sequentially from said separating drum and an outlet end for discharging the paper sheets from the belt;

a counter and sensor adapted for sensing the paper sheets supplied by said supply belt and counting the number of the paper sheets;

a generally horizontal stacker mounted for substantially linear vertical reciprocal movement between an upper position and a lower position adjacent said supply belt outlet end for receiving and stacking a predetermined number of the horizontally oriented paper sheets as they are supplied thereto by said supply belt and counted by said counter and sensor;

a driving means for moving said stacker from its said lower position to its said upper position when said predetermined number of sheets are stacked thereon;

a banding device laterally adjacent to said upper position of said stacker for receiving and banding the paper sheets from said stacker;



laterally movable pusher means for moving said stack of paper sheets laterally from said stacker when in its said upper position and onto said banding device;

an operating unit mounted for movement on said stacker between a substantially horizontal position and a substantially vertical position thereof and carrying a holding plate for holding said sheets in their stacked condition as they are received on said stacker when in its said lower position; and

biasing means having one end connected to said operating unit and a second end in fixed position for biasing said operating unit in a direction such that, when said stacker has been moved to said upper position, said operating unit is moved to its said substantially vertical position and said holding plate is out of engagement with said paper sheets.

4,531,345

CASE LOADER

Nicholas B. Nigrelli, 13234 Westview, Cleveland, Wis. 53015, and Terry J. Nigrelli, 16024 Highway X, Kiel, Wis. 53042

Filed Nov. 1, 1982, Ser. No. 438,214
Int. Cl.³ B65B *5/06, 5/08*
U.S. Cl. 53—534 **15 Claims**

1. A case loader for loading articles having laterally extending neck flanges into a case comprising:

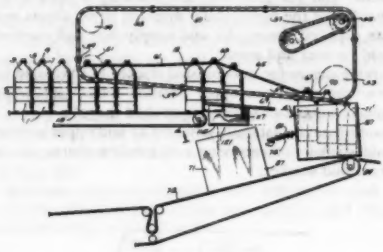
a. grouper means for grouping the articles having such flange into a complement of a selected number of articles, the articles being disposed along at least one conveying path;

b. support means for supporting the articles in the grouper means;

c. at least one pair of guide tracks arranged with respect to the conveying path and spaced by a gap less than the diameter of the neck flanges and greater than the diameter of the article neck to receive the necks of the articles in the gap between the tracks and support the articles under the neck flanges; and

d. means for moving the complement along the guide tracks from the grouper means to a case loading station and for

separating each article in the group individually from the guide tracks at the loading station for loading the complement into the case, said guide tracks being inclined upwardly from the plane of the support means to cause



lifting of the articles from the support means as the articles are moved along the guide tracks and the upward inclination of the guide tracks affording grouping of the complement in close contact.

4,531,346

STIRRUP STAY

Milton D. Brown, Englewood, Colo., assignor to Barbara A. Brown, Hill City, S. Dak.

Filed Sep. 29, 1982, Ser. No. 428,178

Int. Cl.³ B68C *1/16*

U.S. Cl. 54—46 **1 Claim**

1. A device for selectively adjusting the horizontal angle of a western style horse saddle stirrup of the kind suspended from a stirrup strap with an adjustably wrapped loop at the lower end of a saddle fender by a pivot pin received in a loop of the strap, comprising:

(a) an elongated strip of sheet material that is received between inner and outer portions of a stirrup strap and rests in the loop of the stirrup strap, wherein said elongated strip is formed from a material having the flexible, deformable characteristics of sheet metal so as to be deformable under the weight of a fallen horse and to be hand deformable by twisting forces applied about a vertical longitudinal axis thereof for imparting a corresponding twist to the stirrup strap, the elongated strip comprising an inner arm and an outer arm of approximately equal length and, in use, extending upwardly between the inner and outer portions of the stirrup strap, joined together by a U-shaped central portion at the base of the arms that holds the inner and outer arms together;

(b) a yieldable cushioning means covering at least a major portion of said inner arm and outer arm between said inner and outer portions of the stirrup strap for maintaining the arms together; and

(c) wherein, in use, said U-shaped central portion receives the pivot pin of a stirrup and maintains the elongated strip of sheet material between the inner and outer portions of the stirrup strap.

4,531,347

LAWN MOWER WITH WHEEL DRIVE

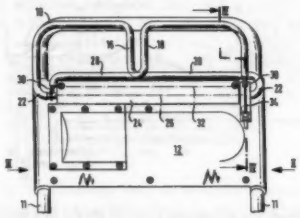
Eberhard Schütz, Daaden, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,856

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302544

Int. Cl.³ A01D *75/18*

U.S. Cl. 56—10.5 **14 Claims**



1. A motor driven lawn mower comprising a motor, a travel drive for being driven by the motor, a handlebar on the mower for being grasped;

a motor starting and operating first switch device connected with the motor and being movable to a first position for starting and operating the motor and being movable to a second position for stopping the motor, the first switch device being in the vicinity of the handlebar;

a clutch between the motor and the travel drive and a second switch device connected with the clutch and being movable to a third position for activating the clutch and being movable to a fourth position for deactivating the clutch, the second switch device being in the vicinity of the handlebar;

means normally returning the first switch device to the second position and the second switch device to the fourth position;

the second switch device being positioned for holding the first switch device in the first position when the second switch device is in the third position, whereby when the clutch is activated, the motor is switched to be operating; and the first switch device being positioned for holding the second switch device away from the third position and toward the fourth position when the first switch device is in the second position, whereby when the motor is switched to be stopped, the clutch is deactivated.

4,531,348

TENSIONING DEVICE FOR POWER TRANSFER ASSEMBLY

Rudy J. C. De Vilder, Loppem, Belgium, and José G. T. Gryspeerdt, New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed May 21, 1984, Ser. No. 612,512

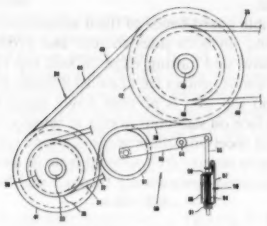
Claims priority, application European Pat. Off., May 27, 1983, 83200754.6

Int. Cl.³ A01D *69/00*

U.S. Cl. 56—11.6 **7 Claims**

1. A belt-type power transfer assembly having spaced apart driving and driven pulleys, endless flexible belt means interengaged between said driving and driven pulleys to transfer rotational power therebetween, and spring-loaded tensioning means operably engaged with the flexible belt means to take up the slack thereof and to maintain proper tension therein when transferring rotational power between said driving and driven pulleys, said spring-loaded tensioning means including a ten-

sion pulley rotatably mounted on a pivot arm and biasing means acting between a fixed support and the pivot arm to urge the latter with the tension pulley thereon in the direction of the flexible belt means, said biasing means including a tension rod pivotally coupled at one end to the pivot arm, the tension rod supporting at a distance therefrom abutting means, and a compression spring provided in the precompressed con-



dition between the abutting means and the fixed support, the improvement comprising:

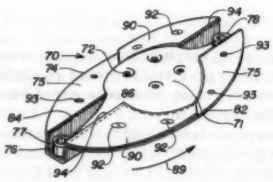
stop means associated with the biasing means compression spring in said spring-loaded tensioning means for restricting the extension of said compression spring to limit the biasing movement thereof in tensioning the flexible belt means when the slack therein reaches a predetermined amount.

4,531,349

ROTARY CUTTER FOR DISC MOWER-CONDITIONER

Philip J. Ehrhart, Narvon; Stanley J. Makofka, and Kenneth W. McLean, both of New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Mar. 23, 1984, Ser. No. 592,643
Int. Cl.³ A01D *55/18, 35/264*
U.S. Cl. 56—13.6 **20 Claims**



1. In a disc mower-conditioner having a mobile frame adapted for forward movement over the ground; rotary cutting means supported by said frame adjacent the ground to sever standing crop material, said rotary cutting means including a transverse cutterbar rotatably mounting a plurality of transversely spaced disc cutters, each said disc cutter having a pair of knives connected thereto for severing standing crop material by impact upon rotation of said disc cutters; crop conditioning means mounted generally rearwardly of said rotary cutting means to condition crop material severed by said disc cutters, an improved disc cutter comprising:

a raised central portion defining an upper plane;

a peripheral portion terminating in a circumferential peripheral edge;

a pair of knife mounting portions defining a lower plane below said upper plane, said knife mounting portions being disposed along said peripheral edge on opposing sides of said raised central portion; and

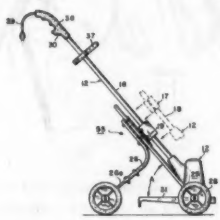
said peripheral portion adjacent said knife mounting portions being formed in an elevated edge on both circumferentially opposing sides of each respective knife mounting portion, said peripheral edge sloping downwardly away from the respective said elevated edge circumferentially toward the opposing knife mounting portion, forming depressed sections circumferentially midway between opposing knife mounting portions, said disc cutter having inclined ramps formed therein between each respective said depressed section and the corresponding elevated edges.

4,531,350

UNIVERSAL WHEELED ASSEMBLY FOR GRASS TRIMMERS

Edward A. Huthmacher, 2807 Country Club Blvd., Sugar Land, Tex. 77478

Filed Sep. 10, 1984, Ser. No. 649,062
Int. Cl.³ A01D *53/14*
U.S. Cl. 56—17.5 **12 Claims**



1. An assembly for supporting and converting a power grass trimmer device into a power mower, the trimmer device including a tubular shaft, a grass-cutting head at one end of the shaft, and a handle at the opposite end of the shaft, comprising:

an upstanding wheeled frame having at least a rear leg, a pair of front legs defining an open space for accepting said head therebetween;

releasable joint means having a first part mounted on the shaft and a cooperative second part mounted on the frame, said joint means being adapted to detachably join the shaft to the frame and in a predetermined upstanding and inclined position against downward and rotational movements thereof, without restricting the shaft from moving upward relative to the frame; and

the frame being steerable by imposing a forward or rearward force on said handle of the trimmer in a direction parallel to the wheels, thereby selectively converting the trimmer into a lawn mower.

4,531,351

ADJUSTABLE MULTIPLE ROW HARVESTER HEAD ASSEMBLY

Eugene A. Sousek, Appleton, Wis., assignor to Piper Industries, Inc., Memphis, Tenn.

Filed Sep. 17, 1982, Ser. No. 419,482
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—98 **5 Claims**

1. An adjustable multiple row head for a crop harvester comprising:

(a) a base;

(b) a plurality of row head units;

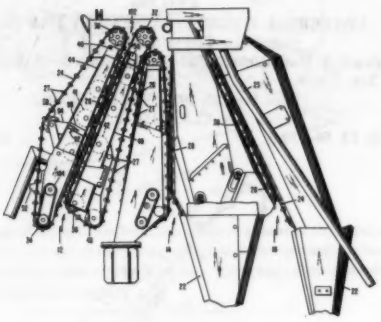
(c) a plurality of cantilevered support arms for said plurality of row head units;

(d) said cantilevered support arms connected to and extending forwardly of said base;

(e) at least one of said row head units including a moveable frame member adjustably pivoted about an axis;

(f) adjusting means comprising a guide means mounted to said moveable frame member for slideably engaging and guiding said moveable frame member on said cantilevered support arm and a jackscrew cooperating with said guide means, said guide means providing a first engaging point

and said cantilevered support arm providing a second engaging point with at least one of said first and second engaging points including a threaded connection for said jackscrew, whereby said guide means, said moveable frame member and said row head units are adjustably positioned about said axis according to rotation of said jackscrew within said threaded connection.



(g) gathering means associated with said moveable frame member and forming an inlet and a passageway for crops being harvested; and

(h) cutting means at said inlet;

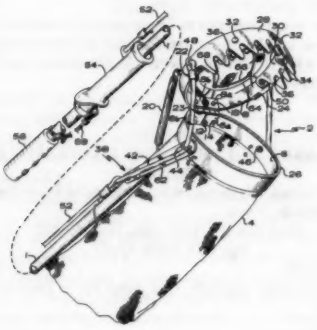
said adjusting means allowing said inlets to said row head units to be spaced apart from each other by infinitely variable displacements.

4,531,352

FRUIT PICKER WITH STEM CUTTING JAWS

Russell W. Henningsgaard, 504 - 5th Ave. S., Hopkins, Minn. 56343

Filed Apr. 23, 1984, Ser. No. 602,823
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—336 **4 Claims**



1. A fruit picker comprising:

an elongated pole handle of sufficient length to permit a person standing on the ground to reach to the upper levels of fruit trees such as orange and apple trees;

a fruit collecting jaw assembly on the upper end of said pole, said jaw assembly comprising a stationary bottom ring affixed to said pole and projecting at an angle thereto, and a movable top ring pivotally attached to said pole above said bottom ring;

a cutting edge extending around the bottom periphery of said top ring;

a mating, contact surface for said cutting edge extending around the upper periphery of said bottom ring;

spring means attached to said top ring and movably biasing said top ring to an open position with respect to said bottom ring;

actuating means manually operable to pivotally swing said top ring downwardly to bring its cutting edge down against said mating contact surface of said bottom ring to thereby sever a fruit stem;

a pair of flexible guard bands of fixed around the periphery of said top ring on both sides thereof and projecting downwardly below said cutting edge on said top ring, whereby said guard bands protect fruit against damage by said cutting edge as said top ring is pivoted down against said mating contact surface on said bottom ring to sever a fruit stem; and

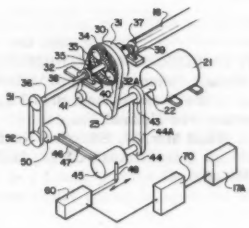
a flexible, fruit receiving chute secured at one end around said bottom ring to receive fruit severed from its stem by said top ring and directed downwardly through said bottom ring.

4,531,353

METHOD AND APPARATUS FOR SPINNING YARN UNDER CONSTANT TENSION

Joseph P. Majette, 4921 Sentinel Post Rd., Charlotte, N.C. 28211

Filed Oct. 5, 1983, Ser. No. 539,096
Int. Cl.³ D01H *1/24, 1/34*
U.S. Cl. 57—94 **9 Claims**



1. An apparatus for varying strand movement speed at given stages of operation of a textile strand processing machine having a prime mover to produce a strand processed with uniform tension, comprising:

(a) a planetary gear box having first and second speed input elements and a speed output element, said speed output element being connected to said strand processing machine for transmitting power thereto at a speed which is the sum of said first and second input elements;

(b) means for transmitting power from the prime mover to the first speed input element at a constant speed;

(c) means for transmitting power from the prime mover to the second speed input element at a variable speed;

(d) data storage means for receiving and storing information correlating the speed of the strand processing machine at given stages during the strand processing with a constant tension on the strand;

(e) sensing means for sensing the stages of operation of the strand processing machine and generating an output signal responsive thereto; and,

(f) logic means responsive to the output signal from the sensing means, the data stored in the data storage means and the power output of the prime mover, and generating an output signal to the means for transmitting power from the prime mover to the second speed input of the planetary gear box at a speed which when summed in the planetary gear box with the first speed input element produces a speed at the speed output element which maintains a constant tension on the strand being processed.

4,531,354
THERMALLY CURABLE WET-IMPREGNATED ROVINGS

Mark R. Zentner, Cary, and Orvid R. Cutler, Jr., Rolling Meadows, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

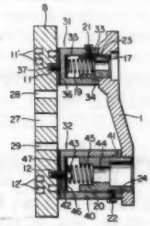
Continuation-in-part of Ser. No. 152,571, May 22, 1980, abandoned. This application Feb. 9, 1984, Ser. No. 578,435
Int. Cl.³ D02G *3/40*
U.S. Cl. 57—250 12 Claims

1. Thermally curable wet-impregnated roving in which the fibers of the roving are uniformly impregnated in the substantial absence of excess liquid with a liquid polyepoxide lacking polymerizable unsaturation and having dispersed therein a latent heat-activatable epoxy curing catalyst, said polyepoxide-catalyst dispersion having a room temperature viscosity of from 2000 to 5000 centipoises and a tack of less than about 6 on a Thwing-Albert inkometer.

4,531,355
JIG FOR ASSEMBLING A TRACK CHAIN

Hirotomo Numakura, Kawasaki, Japan, assignor to Maruma Jyusharyo Kabushikigaisha, Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,355
Claims priority, application Japan, Jan. 14, 1983, 58-3306
Int. Cl.³ B21L *5/00*
U.S. Cl. 59—11 8 Claims



1. In a jig for assembling a track chain comprising pin adapters and bushing adapters attached detachably to tool bars, each adapter comprising an outer hollow cylinder, an inner cylinder received slidably in a bore of said outer cylinder, biasing means held within said outer cylinder for biasing the forward end of said inner cylinder so that it protrudes outwardly from a forward end opening of said bore of said outer cylinder, and stop means attached to said outer cylinder for preventing said inner cylinder from protruding from said outer cylinder beyond a forwardmost position, the improvement comprising each of said outer cylinders has a circular recess in the forward end of the bore of said outer cylinder, which circular recess is coaxial with and of greater diameter than said bore.

4,531,356
INTAKE VORTEX WHISTLE SILENCING APPARATUS AND METHODS

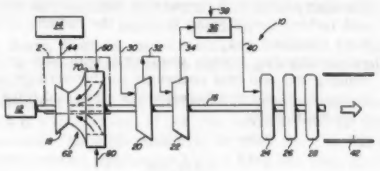
Charles G. Linder, Chandler, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

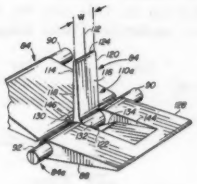
Division of Ser. No. 273,716, Jun. 15, 1981, Pat. No. 4,436,481. This application May 11, 1983, Ser. No. 493,444
Int. Cl.³ F04D *29/66*
U.S. Cl. 60—39.02 11 Claims

1. Apparatus operable to supply compressed gas to a pneumatically-operated device, comprising:

(a) a rotationally drivable centrifugal compressor having an axis of rotation, and an annularly shaped inlet circumscribing said axis;

(b) gas intake means associated with said compressor for flowing gas into said inlet in a swirling pattern generally centered about said axis and having an origin spaced axially outwardly from said inlet, said intake means having a circular, generally radially outwardly facing inlet opening encircling said axis, and an annular gas flow passage connecting said compressor inlet and said inlet opening of said gas intake means; and



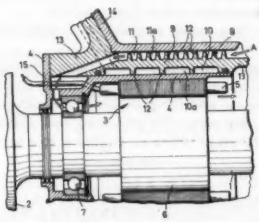


(c) means for disturbing only a relatively small portion of said swirling pattern to attenuate whistle noise caused thereby.

4,531,357
GAS TURBINE ENGINE WITH AN OPERATING-FUEL COOLED GENERATOR

Thomas Weber, Oberursel, and Franz Haselbauer, Münzenberg, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,634
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218927
Int. Cl.³ F01D *25/12*
U.S. Cl. 60—39.07 7 Claims



1. A gas turbine engine for aircraft, comprising:

a compressor;

a rotor shaft;

at least one turbine;

a generator which can be cooled by turbine fuel and is disposed between said compressor and said turbine, said generator being driven by said rotor shaft and serving to supply energy to auxiliary devices of said aircraft, said generator including a generator housing, a stator, and a rotor;

a heat exchanger which co-axially surrounds said generator housing, said heat exchanger including a partition which extends essentially coaxial to said rotor shaft and divides said heat exchanger into two chambers through which

cooling medium flows; said two radially sequentially located and axially continuous flow chambers including a radially inner primary chamber through which turbine fuel flows, and a radially outer secondary chamber through which compressor air flows to be cooled by said turbine fuel flowing through the radially inner primary chamber whereby the generator stator is also cooled by said turbine fuel flowing through the radially inner primary chamber; and

direction-changing means associated with said generator housing and said heat exchanger for furthermore supplying turbine-fuel cooled compressor air to said rotor which is cooled thereby.

4,531,358

OIL SYSTEM FOR AIRCRAFT GAS TURBINE ENGINE

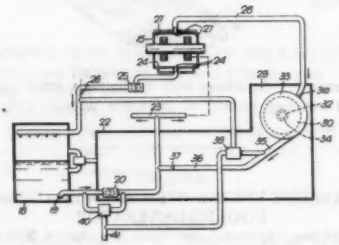
Stanley Smith, Wotton-under-Edge, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 25, 1981, Ser. No. 305,706

Claims priority, application United Kingdom, Sep. 26, 1980, 8031265

Int. Cl.³ F02C 7/06

U.S. Cl. 60—39.08 **10 Claims**



1. An oil supply system for use with an engine having engine bearings and subject to orientation in first and second engine positions, said oil system comprising:

an oil tank configured to receive a quantity of oil;

pump means, having an inlet coupled to said oil tank and an outlet, for pumping oil from said oil tank to said outlet;

first ducting means coupled to said pump outlet for supplying oil pumped from said tank to the bearings of an engine when an engine is in a first position;

second ducting means coupled to receive scavenge oil from the bearings of an engine; and

means coupled to said second ducting means for providing said scavenged oil to said tank when an engine is in said first position and for providing said scavenged oil to said first ducting means for providing said scavenged oil to the engine bearings when an engine is in a second position.

4,531,359

GAS TURBINE ENGINE FUEL SYSTEM

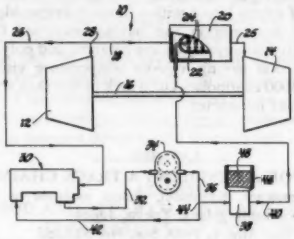
Alan L. Hitzelberger, Grand Blanc, and Everett W. Shows, Lake Orion, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 4, 1983, Ser. No. 548,710

Int. Cl.³ F02C 3/26

U.S. Cl. 60—39.27 **4 Claims**

1. In a gas turbine engine having an operating range between idle and full power and including a combustor, a compressor adapted to supply pressurized air at a variable compressor discharge pressure proportional to engine power to said combustor for fuel combustion within said combustor, a fuel supply apparatus operative to supply metered quantities of powdered combustible fuel, nozzle means at said combustor for dispersing a mixture of said powdered fuel and air into said combustor for combustion therein, an air pump driven independently of said compressor having an inlet and a discharge wherefrom a stream of air is provided at a pump discharge pressure proportional to pump inlet flow area, means connecting said pump discharge to said nozzle means so that said airstream is dispersed by said nozzle means into said combustor, and means connecting said fuel supply apparatus to said pump discharge so that said metered quantities of powdered fuel are entrained in said airstream at said pump discharge pressure and delivered thereby to said nozzle means for dispersal into said combustor, the improvement comprising, valve means at said pump inlet



operative to restrict pump inlet flow area thereby to control said pump discharge pressure, and control means connected to each of said compressor and said air pump and said valve means responsive to the instantaneous magnitude of a ratio of said pump discharge pressure to said compressor discharge pressure and operative to actuate said valve means to vary said pump inlet flow area and thereby said pump discharge pressure to maintain said pressure ratio substantially constant throughout said engine operating range.

4,531,360

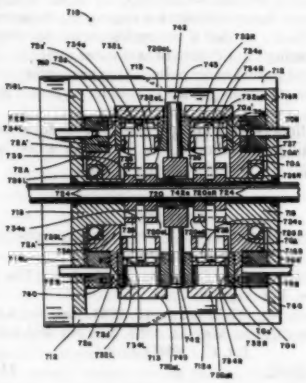
ROTATING CYLINDER EXTERNAL COMBUSTION ENGINE

Everett F. Irwin, 430 Orangewood Dr., Dunedin, Fla. 33528

Division of Ser. No. 202,946, Nov. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 358,190, Mar. 15, 1982, Pat. No. 4,413,486. This application Sep. 27, 1982, Ser. No. 423,859

Int. Cl.³ F02G 3/00

U.S. Cl. 60—39.63 **6 Claims**



1. A rotating cylinder continuous external combustion engine, comprising,

a non-rotatable frame assembly having a longitudinally disposed axis of symmetry,

a first and second bank of axially-spaced cylinder heads disposed in radial relation to said axis of symmetry,

a first and second bank of complementally-formed pistons,

each piston slideably mounted in a different one of said cylinder heads,

said first bank of pistons dedicated to the intake of and compression of air,

said second bank of pistons dedicated to power expansion and exhaust,

a pair of rotatably mounted, longitudinally-spaced circular band members disposed at opposite ends of said frame assembly and having a rotational axis coincident with said frame axis of symmetry, said circular bands abutting and rotating conjointly with associated ones of said cylinder heads,

a pair of non-rotatably-mounted, longitudinally-spaced circular band members disposed at opposite ends of said frame assembly longitudinally outward of and adjacent to said rotatably-mounted circular bands,

a plurality of substantially longitudinally disposed channel means, each channel means formed in a different one of said first and second banks of cylinder heads and extending through an adjacent portion of an associated rotatable circular band,

a combustion chamber mounted longitudinally outward of and adjacent to the non-rotatable circular band associated with the power bank of pistons,

said last-mentioned circular band having a fluid flow passage means formed therein in continuous fluid communication with the interior of said combustion chamber so that combusted fuels exiting said combustion chamber flow through said passage means and sequentially impinge upon the pistons of said power bank.

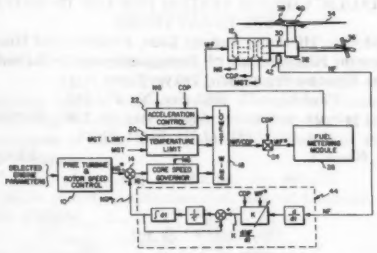
4,531,361
TORSIONAL MODE SUPPRESSOR

Raymond D. Zagranski, Somers, and James J. Howlett, North Haven, both of Conn., assignors to Chandler Evans, Inc., West Hartford, Conn.

Division of Ser. No. 369,494, Apr. 19, 1982, Pat. No. 4,453,378. This application Feb. 13, 1984, Ser. No. 579,378

Int. Cl.³ F02C *3/10, 9/28*

U.S. Cl. 60—39.161 **3 Claims**



1. In a fuel control system for a rotary wing aircraft, the aircraft having an engine comprising a gas generator and a power turbine mechanically decoupled from and driven by the gas generator, the fuel control system including means for producing a gas generator fuel supply command, the improvement comprising:

means for providing a signal commensurate with power turbine speed;

means responsive to said signal commensurate with turbine speed for providing a damping control signal commensurate with speed variations at frequencies in excess of a predetermined minimum, said damping control signal being out of phase with the sensed speed variations;

means for modulating said fuel supply command signal with said damping control signal to produce variations in said fuel supply command signal; and

means responsive to said fuel supply command signal for varying the rate of delivery of fuel to the gas generator to thereby cause the torque produced by the power turbine to oppose variations in speed above the said predetermined frequency.

4,531,362
AERODYNAMIC DAMPING OF VIBRATIONS IN ROTOR BLADES

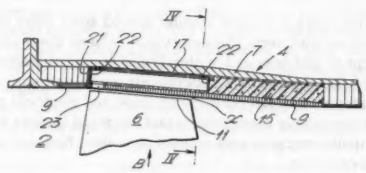
Brian Barry, Duffield, and Christopher Freeman, Farnsfield, both of England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 603,738, Apr. 25, 1984, abandoned, which is a continuation of Ser. No. 320,564, Nov. 12, 1981, abandoned. This application Feb. 14, 1985, Ser. No. 701,644

Claims priority, application United Kingdom, Dec. 29, 1980, 8041413

Int. Cl.³ F01D *5/26*

U.S. Cl. 60—226.1 **11 Claims**



1. An axial gas flow machine comprising: a duct wall bounding a duct, a rotor having blades mounted thereon for rotation within said duct, said blades being subject to a flutter at a known flutter frequency, said flutter giving rise to non-propagating pressure waves of less frequency than pressure waves of far field noise frequencies in gas flow past said blades, said blades during said rotation having radially outer tips which sweep out a path adjacent said duct wall as said rotor rotates, said path having a leading edge and a trailing edge defined with respect to said gas flow and corresponding respectively to leading edges and trailing edges of said blades, said duct wall having openings therein which openings are circumferentially spaced around said duct at least radially adjacent said path of said radially outer tips of said blades, said duct wall further incorporating resonator cavities tuned for resonance to said known flutter frequency, each one of said cavities being in communication with said duct by a corresponding one of said openings, whereby flutter energy from said radially outer tips of said blades is transferred by said non-propagating pressure waves directly into said cavities substantially only as the tips of said blades pass said openings, resonance being produced in said cavities with consequent aerodynamic damping of said flutter in said blades.

4,531,363
DIESEL EXHAUST CLEANER WITH ALTERNATING GLOW PLUG BURNER SYSTEM

Otto A. Ludecke, Rochester, and Terrence L. Stark, Washington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

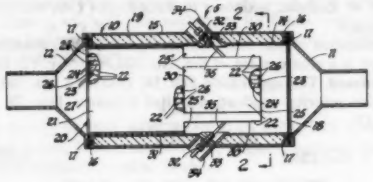
Filed Jul. 30, 1984, Ser. No. 635,557

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—303 **3 Claims**

1. A diesel engine and exhaust cleaner and burner system for use with said diesel engine, said exhaust cleaner and burner system including a housing having an inlet at one end for receiving exhaust gases discharged from said engine and an exhaust outlet at its opposite end; a through flow exhaust particulate filter operatively positioned in said housing and having an inlet end adjacent to said inlet and an outlet end next adjacent to said exhaust outlet in operative sealing engagement with said housing next adjacent to said exhaust outlet, said particulate filter being a cylindrical ceramic monolith structure

with chordal flats at its inlet end and with a plurality of thin interlaced porous walls defining a plurality of parallel passages extending to opposite inlet and outlet ends thereof, said passages including a first group comprising inlet passages open at said inlet end and closed by plugs at the outlet end and a second group comprising outlet passages closed by plugs at said inlet end and open at said outlet end, the arrangement being



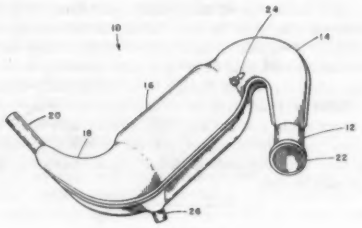
such that there is defined angular spaced apart outer chordal flat porous wall areas through which exhaust gases can flow adjacent to said inlet end; a plurality of electrical igniters, one each of said igniters being operatively associated with one of said outer chordal flat porous wall areas; and electrical control means operatively connected to said electrical igniters so as to sequentially energize said igniters as a time function of said engine operation.

4,531,364

COMPACT EXPANSION CHAMBER FOR SMALL ENGINES

John E. Equi, 3116 Acklen Dr., Huntsville, Ala. 35805

Filed May 21, 1984, Ser. No. 612,629
Int. Cl.³ F02B *27/02*
U.S. Cl. 60—314 **4 Claims**



1. A tuned expansion chamber for a small internal combustion engine and having a generally S-shaped configuration comprising:

an inlet pipe, for attachment to the exhaust pipe of an engine;

a divergent cone attached to said inlet pipe, the opening of said divergent cone being in line with said inlet pipe, said divergent cone being bent through an obtuse angle less than 180 degrees with the center line of said inlet pipe;

a straight tubular section attached to one end of said divergent cone;

a convergent cone having one of its ends attached to the opposite end of said tubular section, said convergent cone being bent through an angle of about 90 degrees with the center line of said tubular section; and

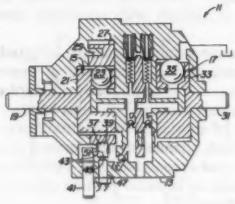
an outlet pipe attached to the opposite end of said convergent cone, said outlet pipe being substantially in line with the said opposite end of said convergent cone.

4,531,365

NEUTRAL START FOR HYDROSTATIC TRANSMISSION

Lee J. Wanie, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 314,814, Oct. 26, 1981, abandoned.
This application Jan. 31, 1984, Ser. No. 575,484
Int. Cl.³ F16D *31/00*
U.S. Cl. 60—328 **1 Claim**



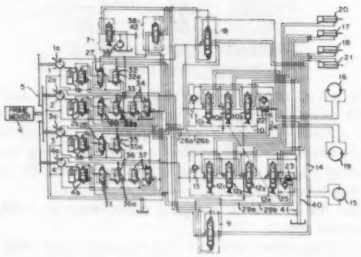
1. In a radial piston hydrostatic transmission including a pump and motor unit in fluid communication, said pump unit rotor carrying a plurality of radial piston balls, a control ring pivotal mount in a pump housing around said rotor, a member pivotally received in a seat on said control ring, a control shaft rotatably mounted in said pump housing having a transversely extending linking arm slidably received in said member such that rotation off said control shaft causes said control ring to pivot, wherein the improvement comprises means for detecting a neutral location of said control ring and for providing resistance to creep of said control ring in said neutral location, said means including said member having a concavity form on one surface, and a switch having a contact surface matingly sized to said concavity, said contact surface of said switch to be received in said concavity when said control ring occupies said neutral location.

4,531,366

HYDRAULIC CIRCUIT SYSTEM FOR USE IN SWIVEL TYPE EXCAVATORS

Yukio Moriya, Hirakata; Tadashi Yoda, Komatsu, and Hisashi Fukumoto, Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,849
Claims priority, application Japan, May 29, 1981, 56-080803
Int. Cl.³ F15B *13/06*; F16H *39/46*
U.S. Cl. 60—421 **5 Claims**



1. A hydraulic circuit system for use in swivel type excavators, said system having swivel motors, running motors, work implements and respective cylinders, which comprises at least first to fourth mutually independent variable displacement pumps, each having a fluid-actuated swash plate servo-mechanism;

a plurality of pilot-operated swivel operation control valve

means controlled by pilot control means, said control valve means arranged to join hydraulic fluid under pressure delivered by a plurality of said first to fourth variable displacements pumps and allow the joined hydraulic fluid to flow into said swivel motor and also arranged at their respective neutral positions to join hydraulic fluid respectively delivered by said pumps with hydraulic fluid respectively delivered by the other pumps, respectively, and allow the latter joined hydraulic fluid to flow into operation control valve groups, respectively, which serve to control manipulations of work implements;

a plurality of operation control valve means for supplying pressurized hydraulic fluid introduced into the operation control valve groups into said plurality of running motors and respective cylinders for the work implements;

pressure detector means connected to the outlets of said operation control valve groups, respectively, for detecting the pressure of pressurized hydraulic fluid delivered when all of the operation control valves are located at their respective neutral positions;

a plurality of negative control valve means for controlling respective servo-mechanism of said first to fourth variable displacement pumps by the action of the pressure detected by means of said pressure detector means so as to reduce the flow rate of hydraulic fluid delivered by said variable displacement pumps to a minimum;

a plurality of cut off valve means connected in series with said negative control valve means for limiting the hydraulic fluid pressure supplied into the servo-mechanism when the hydraulic fluid pressure delivered by said first to fourth variable displacement pumps has become abnormally high; and

a plurality of power control valve means connected in series with said cut off valve means for use with the second and fourth variable displacement pumps and arranged to receive the hydraulic fluid pressure delivered by said first to fourth variable displacement pumps and control pressurized hydraulic fluid to be supplied into the servo-mechanisms so as not to allow the hydraulic fluid pressure delivered by said first to fourth variable displacement pumps to exceed the performance of a prime mover driving the pumps and so as to drive said first to fourth variable displacement pumps with a constant output.

4,531,367

CONTROL AND REGULATING MEANS FOR AN ADJUSTABLE HYDROSTATIC UNIT

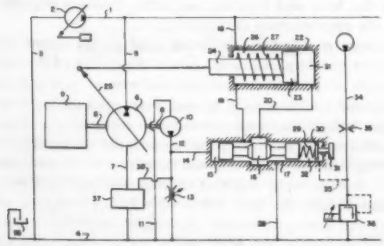
Wolfgang Backe, Aachen; Franz Weingarten, Frechen, and Hubertus Murrenhoff, Aachen, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,330

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1981, 3130660

Int. Cl.³ F16D *33/02*

U.S. Cl. 60—447 **12 Claims**



1. A control and regulating arrangement for an adjustable-hydrostatic unit including at least one adjustable hydraulic motor comprising adjusting means on said motor regulating the output thereof, a connection from said hydraulic motor to a load to be driven by said hydraulic motor, a substantially constant high pressure hydraulic source adapted to supply at least one or more motors, a direct connection from said high pressure hydraulic source to said motor, regulating means for said hydraulic motor, said regulating means including a control pressure pump driven by said hydraulic motor in common with the load being driven, a low pressure line spaced from the high pressure line, a first connection delivering fluid to said control pressure pump from said low pressure line, a second connetion between said control pressure pump and the low pressure line returning pressure fluid to the low pressure line from the control pressure pump, a first regulating cylinder spaced from said control pump, first piston means in said cylinder, a branch line from said second connection to said cylinder, restrictor means in said second connection between the low pressure line and the branch line whereby the pressure fluid between the pump and restrictor acts on one side of the piston to move it in the regulating cylinder, a resilient means in the cylinder acting on the piston opposing said pressure fluid action, a second regulating cylinder spaced from the first cylinder, a second regulating piston in said second cylinder connected to said adjusting means on the adjustable hydraulic motor, resilient means normally urging said adjusting means to produce minimum stroke volume, a connection between said first and second cylinder whereby when said first regulating piston is moved against the resilient means in the first cylinder fluid is delivered to the second cylinder to move the control piston against the resilient means in the second cylinder to move the adjusting means to control the stroke volume in accordance with the pressure from the control pump.

4,531,368

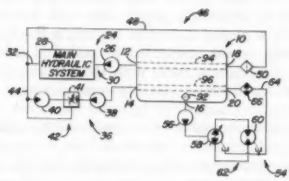
RESERVOIR FOR A MULTI-PUMP HYDRAULIC SYSTEM

Dale H. Killen, Colona, Ill., assignor to Deere & Company, Moline, Ill.

Filed Dec. 19, 1983, Ser. No. 562,657

Int. Cl.³ F16D *33/02*

U.S. Cl. 60—453 **16 Claims**



6. A hydraulic system for a mobile machine comprising:

a reservoir for holding hydraulic fluid and having a plurality of walls and included in said walls, first and second inlets and first, second and third outlets of the reservoir, said inlets and outlets being normally submerged in the hydraulic fluid;

first and second hydraulic circuit portions, substantially outside the reservoir, in fluid communication with the first and second outlets respectively, each portion including at least one hydraulically actuated device and means for withdrawing a supply flow of fluid from the reservoir through the respective outlets for actuating the devices and delivering respectively, first and second return flows of fluid;

a third hydraulic circuit portion, substantially outside the reservoir, for receiving the first and second flows of return fluid and combining them into a main return flow and delivering said return flow to the first inlet;

a fourth hydraulic circuit portion, substantially outside the reservoir, providing fluid communication between the third outlet and second inlet and including a hydraulically

actuated device and means for withdrawing fluid from the reservoir through the third outlet for actuating the device and delivering a third return flow of fluid through the second inlet; and

a first foraminous conduit having respective opposite ends, carried inside the resevoir, and providing fluid communication between the first inlet and the first outlet so that a portion of the main return flow enters the reservoir through the foramina of the conduit and a second portion passes through the conduit directly to the first outlet.

4,531,369

FLUSHING VALVE SYSTEM IN CLOSED CIRCUIT HYDROSTATIC POWER TRANSMISSION

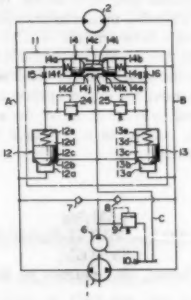
Eiki Izumi; Hiroshi Watanabe; Yukio Aoyagi; Kazuo Honma, and Kichio Nakajima, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,756

Claims priority, application Japan, Mar. 2, 1981, 56-28346

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—456 **6 Claims**



1. In a closed circuit hydrostatic power transmission comprising a variable displacement hydraulic pump, a hydraulic actuator, first and second main lines connecting said variable displacement hydraulic pump and said hydraulic actuator together in a closed hydraulic system, a fluid tank, and fluid replenishing means connected to said first and second main lines for replenishing them with the working fluid from said fluid tank, the flushing valve system interposed between said first and second main lines and said fluid tank and operative, when a predetermined level of pressure differential is produced between said first and second main lines, to bring the main line on a lower pressure side into communication with the fluid tank and a main line on a higher pressure side out of communication therewith, said flushing valve system comprising:

a first poppet valve located between said first main line and the fluid tank for bringing the first main line and the fluid tank into and out of communication with each other;

a second poppet valve located between the second main line and the fluid tank for bringing the second main line and the fluid tank into and out of communication with each other;

each of said poppet valves comprises an inlet chamber connected to the main lines, an outlet chamber connected to the fluid tank, a valve seat interposed between said inlet chamber and said outlet chamber, a poppet cooperating with said valve seat to bring said inlet chamber and said outlet chamber into and out of communication with each other, said poppet being urged by an internal pressure of the inlet chamber in a direction away from the valve seat, spring means for urging said poppet to move toward said valve seat by a biasing force thereof, and means comprising a pressure chamber for exerting a force corresponding to the internal pressure of said pressure chamber on said poppet to urge the poppet toward the valve seat; and

pressure differential responding means including two pressure sensing means respectively communicating with the first and second main lines, two change-over ports communicating the respective pressure chambers of the poppet valves and a common port communicating with the fluid tank for enabling the changeover port to communicate with the pressure chamber of the poppet valve located between the main line on the higher pressure side and the tank to be brought into communication with the common port and the change-over port communicating with the pressure chamber of the poppet valve located between the main line on the lower pressure side and the tank to be brought out of communication with the common port.

4,531,370

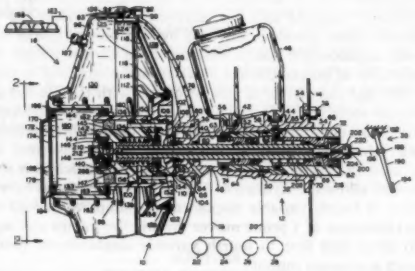
BRAKE ACTUATION ASSEMBLY

Richard T. Hendrickson, South Bend, Ind., and Larry G. Lohraff, Berrien, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 1, 1982, Ser. No. 437,940

Int. Cl.³ B60T *13/14;* **F15B** *9/10, 13/10*

U.S. Cl. 60—554 **12 Claims**



9. In a brake actuation assembly having a master cylinder and a power assist apparatus, said power assist apparatus having a return spring that urges a wall toward a rest position and a valve responsive to an input signal for controlling the development of a pressure differential that acts on said wall to create an output force to move the wall from the rest position toward an operational position, said master cylinder having a housing with a bore therein, said bore having passages for connecting said bore with a fluid reservoir and a pressure responsive device, piston means located in said bore, linkage means for connecting said wall with said piston means, said linkage moving said piston means toward said power assist apparatus on movement of said wall from said rest position to pressurize fluid in the bore and operate said fluid pressure responsive device, the improvement comprising:

adjustment means for positioning said piston means with respect to said passages to control the timing of the interruption of the fluid communication between said bore and reservoir on movement of said wall, said return spring urges said piston means toward said adjustment means in the absence of an input signal to provide communication through said passages into said bore for fluid in said reservoir, and an input rod that extends through said piston means to provide said valve with an input signal, said input rod having a shoulder that engages said piston means in the absence of the development of a pressure differential across said wall to manually move said piston means and pressurize the fluid in said bore to provide said pressure responsive device with operational fluid pressure.

4,531,371

PROCESS AND APPARATUS FOR PRODUCING NITROGEN AND OXYGEN

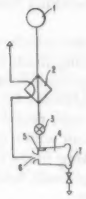
Grigory I. Voronin, ploschad Vosstania, 1, kv. 447; Alexandr D. Suslov, ulitsa B. Spasskava, 32, kv. 312; Jury V. Chizhikov, Degtyarny pereulok, 10, kv. 6; Sergei V. Ivanov, Sevasto polsky prospekt, 44, korpus 4, kv. 260, and Valentin G. Voronin, ulitsa Gorkogo 43, kv. 144, all of Moscow, U.S.S.R.

PCT No. PCT/SU80/00163, § 371 Date May 12, 1982, § 102(e) Date May 12, 1982, PCT Pub. No. WO82/01242, PCT Pub. Date Apr. 15, 1982

Continuation of Ser. No. 380,932, May 12, 1982, abandoned. This PCT application Sep. 25, 1980, Ser. No. 660,246

Int. Cl.³ F25B *9/02*

U.S. Cl. 62—5 **10 Claims**



1. A process for separating air into a nitrogen enriched stream and an oxygen enriched stream which comprises: introducing partially liquified compressed air at a pressure of from 0.3 to 0.6 MPa at a temperature in the range of 90° to 100° K. into at least one vortex tube wherein the partially liquefied air is separated into a stream enriched in oxygen and a stream enriched in nitrogen.

4,531,372

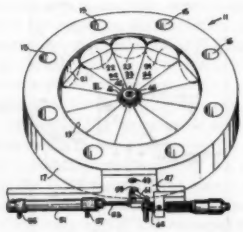
CRYOGENIC PUMP HAVING MAXIMUM APERTURE THROTTLED PART

Edward J. Slabaugh, San Jose, Calif., assignor to Comptech, Incorporated, San Jose, Calif.

Continuation-in-part of Ser. No. 412,251, Aug. 27, 1982, Pat. No. 4,393,896. This application Jul. 15, 1983, Ser. No. 514,156

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **20 Claims**



1. Low-temperature pumping apparatus comprising,

a cryogenic pump of the type having a chilled outer wall surface for first stage pumping of gases condensable at medium temperatures and a chilled inner wall surface for second stage pumping of gases condensable at low temperatures, said pump having a port facing a process chamber being pumped,

a throttling valve disposed between the port and said process chamber, said throttling valve having a plurality of openable radial vanes disposed in side-by-side relation in a common plane and a means for mechanically linking said vanes to each other for communication of motion, said means located at vane edge opposite a radial center and within a structure into which said vane edge is mounted, said vanes mounted at said radial center for tilting out of the common plane and maintained in thermal contact with said outer pump surface wall, and

means for imparting rotational motion to one of the said vanes from the exterior of said valve.

4,531,373

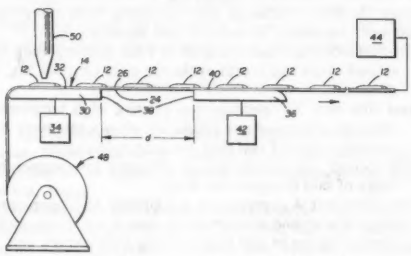
DIRECTIONAL SOLIDIFICATION FOR THE CONTROLLED FREEZING OF BIOMATERIALS

Boris Rubinsky, Berkeley, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Filed Oct. 24, 1984, Ser. No. 664,164

Int. Cl.³ F25D *13/06*

U.S. Cl. 62—63 **21 Claims**



1. An apparatus (**10**) for the controlled freezing of a material (**12**), comprising:

a longitudinally extending substrate (**14**) having a thickness, δ, a leading end (**16**), a trailing end (**18**), a first surface (**24**), and a second surface (**26**), said second surface **26** being adapted to support an aliquot of said material (**12**) thereon;

a first base (**30**) having a first heat transfer surface (**32**) adapted to sit in heat transfer relation with said first surface (**24**);

first temperature control means (**34**) for controlling the temperature, T_H, of said first base (**30**) to be above the freezing temperature of said material (**12**);

a second base (**36**) spaced longitudinally a distance, d, from said first base (**30**) to define a gap (**38**) therebetween and having a second heat transfer surface (**40**) adapted to sit in heat transfer relation with said first surface (**24**);

second temperature control means (**42**) for controlling the temperature, T_C, of said second base (**36**) to be below the freezing temperature of said material (**12**); and

moving means (**44**) for moving said substrate (**14**) generally longitudinally across said first base (**30**) in the direction of said second base (**36**) with said first surface (**24**) in heat transfer relation with both said first heat transfer surface (**32**) and said second heat transfer surface (**40**).

4,531,374
MULTI-STAGE APPARATUS HAVING WORKING-FLUID AND ABSORPTION CYCLES, AND METHOD OF OPERATION THEREOF

Georg Alefeld, Josef-Raps-Strasse 3, D-8000 Munich 40, Fed. Rep. of Germany

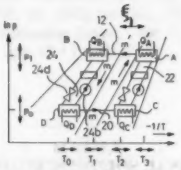
PCT No. PCT/EP82/00063, § 371 Date Sep. 2, 1982, § 102(e) Date Sep. 2, 1982, PCT Pub. No. WO82/03448, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 24, 1982, Ser. No. 417,118

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111552; Apr. 28, 1981, 3116788; Jun. 19, 1981, 3124007; Aug. 17, 1981, 3132461; Feb. 12, 1982, 3204902; Feb. 18, 1982, 3205872

Int. Cl.³ F25B 7/00

U.S. Cl. 62—79 45 Claims



1. A multistage heat energy utilizing apparatus comprising a plurality of exchange units which operate in three different pressure ranges and which are comprised in first and second working fluid circuits and at least one absorbent circuit, in which circuits the pressure and temperature levels of the working fluid are changed by supplying or withdrawing available energy, the term "exchange unit" including units operating as generator, condensor, evaporator and absorber;

the first working fluid circuit (A in FIG. 3) comprising first, second, third and fourth exchange units (A_1, A_2, A_3, A_4) of which

said first unit A_1 operates in a relative high temperature range of a first pressure range, which is a relatively high pressure range of said first working fluid circuit,

said second unit A_2 operates in relatively low temperature range of said first pressure range,

said third unit A_3 operates in a relatively low temperature range of a second pressure range which is a relatively low pressure range of said first working fluid circuit, and

said fourth unit A_4 operates in a relatively high temperature range of said second pressure range;

said second working fluid circuit (B) comprising fifth, sixth, seventh and eigth exchange units (B_1, B_2, B_3, B_4) of which

said fifth unit B_1 operates in a relatively high temperature range of a third pressure range which is a relatively high pressure range of said first working fluid circuit,

said sixth unit B_2 operates in a relatively low temperature range of said third pressure range,

said seventh unit B_3 operates in a relatively low temperature range of a fourth pressure range which is the relatively low pressure range of said working fluid circuit, and

said eighth unit B_4 operates in a relatively high temperature range of said fourth pressure range;

said first and second working fluid circuits having one exchange unit in common so that a specific exchange unit operates as exchange unit in both said first and said second working fluid circuits, which therefore comprise in total seven exchange units, and

wherein further one condition of the following set of conditions is fulfilled:

(a) the single exchange unit which is common to both of said first and second working fluid circuits forms any of the folllowing pairs of exchange units in said first and second circuits: A_1,B_1; A_1,B_2; A_1,B_3; A_1,B_4; A_2,B_1; A_2,B_2; A_2,B_4; A_3,B_1; A_3,B_4; A_4,B_1; A_4,B_2; A_4,B_3; A_4,B_4;

(b) the single exchange unit which is common to both of said first and second working fluid circuits forms said second (A_2) and said seventh (B_3) exchange units;

means for internal heat exchange is provided between at least two exchange units;

(c) the single exchange unit which is common to both of said first and second working fluid circuits forms said second (A_2) and said seventh (B_3) exchange units;

both working fluid circuits are heat pump circuits,

said exchange units comprise first and second generators, said first generator operating in higher pressure range than said second; said first generator being comprised in an absorption circuit in which, at given pressures, the working fluid system has a vapor pressure curve which is at higher temperatures than the vapor pressure curve of a second absorption circuit comprising said second generator;

(d) at least one of said working fluid circuits is a heat transformer circuit;

(e) the single exchange unit which is common to both of said first and second working fluids forms said third (A_3) and seventh (B_3) exchange units; both working fluid circuits are heat pump circuits, means for internal heat exchange is provided between at least two exchange units,

(f) the single exchange unit which is common to both of said first and second working fluids forms said third (A_3) and seventh (B_3) exchange units; both working fluid circuits are heat pump circuits;

said exchange units comprise first and second generators, said first generator operating in higher pressure range than said second; said first generator being comprised in an absorption circuit in which, at given pressures, the working fluid system has a vapor pressure curve which is at lower temperature than the vapor pressure curve of a second absorption circuit comprising said second generator.

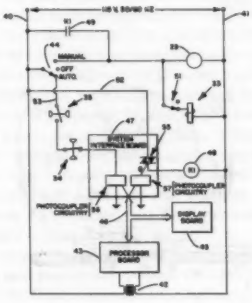
4,531,375
PURGE SYSTEM MONITOR FOR A REFRIGERATION SYSTEM

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,066

Int. Cl.³ F25B 43/04

U.S. Cl. 62—85 4 Claims



1. A refrigeration system having a purge system for removing noncondensible gases from the refrigeration system comprising:

switch means for turning the purge system on and off in response to control signals provided to said switch means when the purge system is operating in an automatic mode of operation;

processor means for monitoring operation of the purge system, for detecting if the purge system has operated continuously for a period of time greater than a predeter-

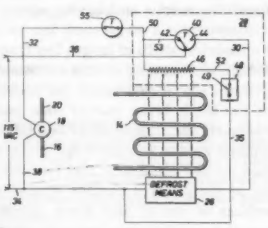
mined amount of time, and for providing an override control signal to the switch means to turn off the purge system when said processor means determines that the purge system has operated continuously for a period of time greater than the predetermined amount of time;

the processor means further comprising means for timing the override control signal provided to the switch means by the processor means and for discontinuing the override control signal after the override control signal is continuously provided to the switch means for a period of time greater than a preselected amount of time; and means for counting the number of consecutive override control signals provided to the switch means by the processor means and for preventing discontinuance of an override control signal if the number of consecutive override control signals supplied to the switch means exceeds a preselected number.

4,531,376
REFRIGERATOR DEFROST CONTROL

Richard H. Alsenz, 2402 Creek Meadows Dr., Missouri City, Tex. 77459

PCT No. PCT/US81/00881, § 371 Date Aug. 27, 1982, § 102(e) Date Aug. 27, 1982, PCT Pub. No. WO83/00211, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 26, 1981, Ser. No. 417,561
Int. Cl.³ F25D *21/02, 21/06*
U.S. Cl. 62—156 **28 Claims**



1. An evaporator defrost control for use in a refrigeration system including a refrigerating fluid compressor, a condenser, an evaporator, and an evaporator defrost means, the control comprising:

defrost initiating means operable independently of absolute temperature for requiring defrost of the evaporator,

defrost terminating means positioned in a heat transfer relationship to the evaporator and responsive to the temperature thereof, said means responsive to a preselected high temperature level for energizing the compressor for cooling the evaporator and terminating defrost, said defrost termination means further responsive to a preselected low temperature level for de-energizing the compressor and energizing the evaporator defrost means, and

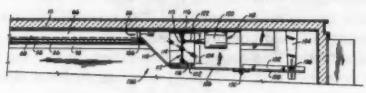
heating means positioned in heat transfer proximity to said defrost terminating means and responsive to said defrost initiating means for heating said defrost terminating means above said preselected low temperature level, said heating means being de-energized by said defrost initiating means when a defrost is required for permitting said defrost terminating means to cool below said preselected low temperature level for energizing the evaporator defrost means and de-energizing the compressor,

the evaporator defrost means heating the evaporator to a temperature above said pre-selected high temperature level for causing said defrost terminating means to respond and re-energize the compressor and de-energize the evaporator defrost means.

4,531,377
TEMPERATURE CONTROL APPARATUS FOR MOUNTING IN A TRANSPORTABLE BODY

Albert H. Zajic, Oklahoma City, Okla., assignor to American Trailers, Incorporated, Oklahoma City, Okla.

Filed Aug. 4, 1983, Ser. No. 520,174
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—187 **16 Claims**



1. An apparatus for providing temperature control to at least two compartments of a transportable body having a fixed ceiling and having means for providing temperature-treated air to the interior of said transportable body, comprising:

false ceiling means for providing a first passageway and a second passageway between at least a first one of said compartments and a second one of said compartments, said false ceiling means including:

a duct housing having a plurality of ducts defined therein; and

mounting means for removably mounting said duct housing within said transportable body so that said duct housing provides a second ceiling within said transportable body below said fixed ceiling;

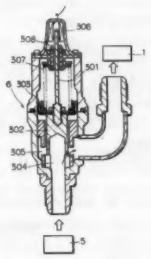
passageway control means, associated with an end of said first passageway which is disposed in said first one of said compartments when said false ceiling means is mounted in said transportable body, for controlling the introduction of said temperature-treated air into said first passageway; and

air channeling means for adjustably channeling at least a portion of said temperature-treated air to said passageway control means.

4,531,378
AUTOMOTIVE REFRIGERATION SYSTEM

Yasuyuki Nishi, Obu; Masasi Takagi, Kariya, and Masao Sakurai, Obu, all of Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 441,861, Nov. 15, 1982, abandoned. This application Apr. 24, 1984, Ser. No. 603,413
Claims priority, application Japan, Nov. 16, 1981, 56-183498
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—217 **4 Claims**



1. An automotive refrigeration system comprising:

a variable capacity refrigerant compressor;

means connected with said compressor for varying the displacement of said compressor;

an evaporator coupled to said compressor in said refrigeration system for evaporating said refrigerant;

a conduit connecting said evaporator to said compressor;

a throttling valve disposed in said conduit, said throttling

valve having a valve body therein capable of assuming any position between limits for throttling to any degree between limits a flow of said refrigerant through said conduit to said compressor in response to a pressure of said refrigerant applied thereto to control a pressure in said evaporator constant;

means for detecting said position of said valve body to generate a signal which varies as said position of said valve body varies between said limits; and

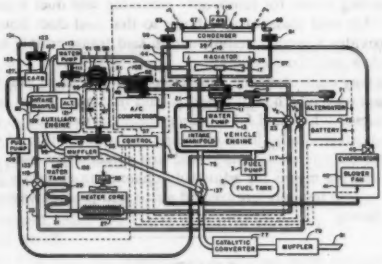
electric circuit means connected with said position detecting means and said compressor displacement varying means for actuating said compressor displacement varying means in response to said signal from said position detecting means.

4,531,379

AUXILIARY POWER SYSTEM FOR VEHICLE AIR CONDITIONER AND HEATER

Robert E. Diefenthaler, Jr., 4195 3rd Ave., NW., Naples, Fla. 33999

Filed Oct. 14, 1983, Ser. No. 541,982
Int. Cl.³ F25B *27/00*; B60H *3/04*; F01P *7/10*
U.S. Cl. 62—236 **20 Claims**



1. An integrated main and auxiliary power system for a vehicle, comprising:

an engine compartment;

a main internal combustion engine disposed in said compartment for moving said vehicle;

air conditioning means including a compressor means disposed in said compartment for cooling the interior of said vehicle;

means disposed in said compartment for selectively connecting said main engine to said compressor means for driving the air conditioning means;

an auxiliary internal combustion engine disposed in said compartment for selectively operating said compressor means when said main engine is turned off;

shaft assembly means disposed in said compartment for coupling said auxiliary engine to selectively operate said compressor means;

a fuel tank for supplying fuel to the main and auxiliary engines;

a radiator disposed in said compartment adjacent to said main engine in fluid communication with the main engine for circulating coolant fluid to cool the main engine when the engine is operating;

means disposed in said compartment for connecting said auxiliary engine in fluid communication with said radiator for circulating coolant fluid to cool the auxiliary engine when the auxiliary engine is operating;

an exhaust pipe connected to said main engine for expelling exhaust gases emitted when the engine is operating; and

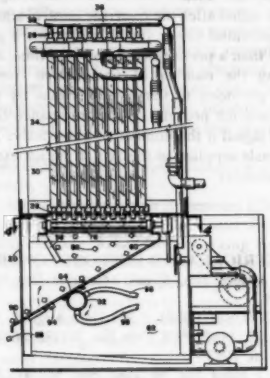
connector means for connecting said auxiliary engine to said exhaust pipe for expelling exhaust gases emitted when the auxiliary engine is operating.

4,531,380

ICE MAKING MACHINE

William F. Hagen, Argyle, Tex., assignor to Turbo Refrigerating Company, Denton, Tex.

Filed Jan. 10, 1984, Ser. No. 569,614
Int. Cl.³ F25C *5/10*
U.S. Cl. 62—320 **10 Claims**



9. Apparatus for manufacturing ice comprising:

a plurality of elongated vertical tubes of uniform internal cross-sectional dimensions and having upper and lower ends,

a plurality of cylindrical shells of length less than said tubes, one of said shells surrounding at least a substantial portion of the length of each of said tubes, the internal nominal diameter of the shells being greater than the maximum external cross-sectional dimensions of said tubes, the shells having a spiraled groove formed in the walls thereof, the depth of each groove being such that the interior surface of the shells at the grooves contact at least part of the exterior surfaces of one of said tubes, thereby forming flow paths in the annular areas between the exteriors of said tubes and the interiors of said shells which are, at least in part, spiraled, the upper and lower ends of said shells being closed,

means for expanding a refrigerant in said tube-shell annular areas to chill said tubes,

means for flowing water downwardly through said tubes while chilled to cause rods of ice to form in said tubes,

means to heat said tubes to cause the release of rods of ice formed in said tubes to move downwardly out the lower ends of said tubes,

said tubes and shells being spaced juxtaposed and parallel to each other for simultaneously forming rods of ice in said tubes and heating said tubes to release the ice formed therein,

a baffle positioned below said tubes and having one mode for conducting water flowing from the lower ends of said tubes into a water collection chamber and having another mode for directing ice released from said tubes onto an ice delivery chute above said water collection chamber,

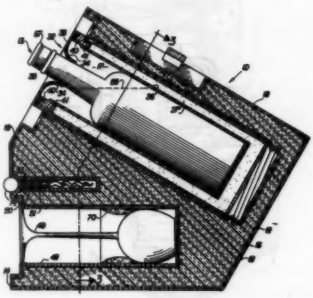
said baffle being supported about a horizontal axis, and including a tank secured to said baffle to pivot said baffle in one direction to deflect water into said collection chamber and in another direction to conduct ice onto said delivery chute,

said baffle being biased to normally take the position to conduct ice onto said delivery chute, and including means to flow water into said tank to cause said baffle to pivot to the position to cause it to deflect water into said collection chamber.

4,531,381
COOLER ASSEMBLY

Henry D. Toro, 85 E. 34 St., Hialeah, Fla. 33013, and Erick Valle, 1502 E. 8 Ct., Hialeah, Fla. 33010

Filed Sep. 6, 1984, Ser. No. 647,760
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—372 16 Claims



1. A cooler assembly primarily designed to cool and maintain a bottled liquid at a lower than ambient temperature, said assembly comprising:

(a) a housing formed from insulating material and including a cooling compartment mounted to extend into the interior thereof,

(b) said housing including a base portion structured for support of said housing on a substantially horizontal surface,

(c) auxiliary compartment means formed within said housing and structured for containment of ancillary objects therein,

(d) said cooling compartment comprising an inner sleeve and an outer sleeve secured together in substantially coaxial, spaced apart and telescoping relation to one another and a hollow interior portion defined within said first sleeve and dimensioned and configured to at least partially receive a bottle therein,

(e) a coolant chamber defined between said spaced apart inner sleeve and outer sleeve and structured for maintenance of a coolant therein, said coolant chamber disposed in heat transferring relation to said inner sleeve and said hollow interior portion thereof, and

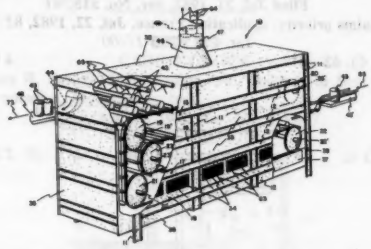
(f) closure means connected to said cooling compartment and structured for closing and opening of said coolant chamber and at least partial closure of said hollow interior portion, whereby coolant may be added thereto or removed therefrom.

4,531,382
SPIN COOLER

Donald L. Butler, Raleigh, and Thomas E. Martin, Cary, both of N.C., assignors to Aeroglide Corporation, Raleigh, N.C.

Filed Aug. 18, 1983, Ser. No. 524,448
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—375 11 Claims

1. An improved cooling system for product containers comprising: a plurality of track rail means so arranged to form a plurality of laterally adjacent product container travel lanes each containing a plurality of tiers; entry and exit means to and from said travel lanes for product containers; a plurality of crossovers for interconnecting each said product container travel lane with at least one adjacent lane such that product containers move from one lane to an adjacent lane at said crossovers; a plurality of pusher bar means extending across said lanes for rollingly moving said containers therealong; means for interconnectingly driving said pusher bar means such that said containers travel substantially the entire length of every lane in every tier prior to exiting said cooling system so as to properly cool the product therein while said system

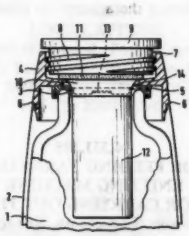


requires only a relatively small amount of floor space; and means for forming an active cooling system for cooling product containers as they move along said lanes.

4,531,383
COOLING THE LIQUID IN AN INSULATING CONTAINER

Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany .

Filed Dec. 19, 1983, Ser. No. 563,162
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3331954
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—457 3 Claims



1. An insulating container comprising:

a sealing cup for holding liquids, said cup including an opening for the passage of liquid therethrough;

a cover supporting said sealing cup;

a lid for attachment to said cover;

sealing means for preventing the passage of liquid from the container when the lid is secured to said cover;

attachment means for removably securing said lid to said cover; and

a cooling member removably attached to said lid for extending through said opening sufficiently far when said lid is secured to said container to immerse said cooling member in a liquid in said sealing cup, said cooling member having an external circumference substantially equal to but not contacting an inner surface of said opening; and

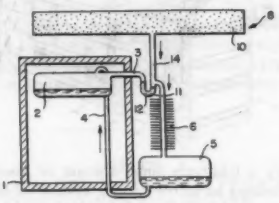
said lid including joining means having a downwardly extending flange at an end thereof for threadedly engaging a corresponding upwardly extending flange on said cooling member, thereby detachably joining said cooling member to said lid.

4,531,384

SOLAR-POWERED REFRIGERATION UNIT

Gérard F. Paeye, Champagne sur Seine, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Jul. 21, 1983, Ser. No. 515,761
Claims priority, application France, Jul. 22, 1982, 82 12824
Int. Cl.³ F25B *17/00*
U.S. Cl. 62—477 **4 Claims**



1. A refrigeration unit which operates by means of heat energy and wherein the mode of operation comprises a desorption phase and an adsorption phase, said refrigeration unit comprising an energy collector containing a material possessing high adsorption and desorption capacity for refrigerant fluid connected in circuit with an evaporator situated within an insulation chamber, said circuit including a conduit extending from said energy collector, a first pipe which connects said conduit to said evaporator, a second pipe which connects said conduit to a condenser, and a third pipe which connects said condenser to said evaporator, said first and second pipes forming a junction with said conduit, said circuit containing a refrigerant fluid, said refrigeration unit being characterized by the fact that the first pipe, immediately before said junction, contains an elbow forming siphon means whose width, angle, and bending radius cause condensation derived from said fluid to accumulate and form an obstruction which, during the desorption phase, blocks the first pipe and which is removed by evaporation during the adsorption phase, leaving the first pipe open.

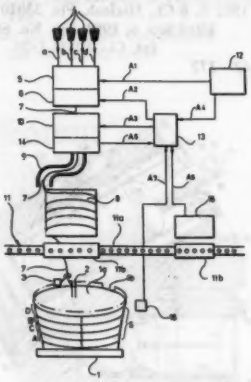
4,531,385

METHOD FOR FEEDING YARNS OF DIFFERENT COLORS TO A KNITTING MACHINE AND KNITTING MACHINE FOR CARRYING OUT THAT METHOD

Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

PCT No. PCT/EP82/00083, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982, PCT Pub. No. WO82/03642, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 16, 1982, Ser. No. 420,224
Claims priority, application Sweden, Apr. 16, 1981, 8102464
Int. Cl.³ D04B *15/48, 15/60, 15/62*
U.S. Cl. 66—132 T **10 Claims**

1. In combination, a knitting machine for producing striped fabrics with yarns of different colors, a selection unit for selecting yarns from yarn supplies, a yarn knotting device arranged in cooperation with said selection unit for knotting yarn sections with lengths predetermined in dependence of the striping pattern of the knitting machine to form a continuous yarn, an intermediate yarn storage device for feeding said continuous yarn to a knitting system of the knitting machine, and a control unit provided with a patterning unit for controlling said selection unit, the improvement wherein the control unit contains a secondary control unit for receiving information representing (1) the fabric pattern, (2) the yarn length consumed by the knitting machine, (3) the yarn length stored in the intermediate yarn storage device and (4) the initial working position of the knitting machine, said secondary control unit including means



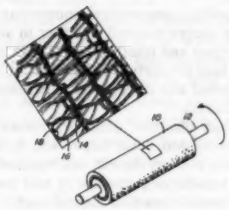
for controlling the yarn knotting device and a drive of a storage forming element of the intermediate storage device.

4,531,386

FABRIC COVER FOR DAMPENER ROLLS

William T. England, and Wing Y. T. Lau, both of Seneca, S.C., assignors to The Kendall Company, Boston, Mass.

Filed Jun. 1, 1983, Ser. No. 500,052
Int. Cl.³ D04B *7/16*
U.S. Cl. 66—202 **4 Claims**



1. In a circular weft knitted water shrinkable dampener roll cover fabric having wales and courses, the improvement comprising a ground yarn; a pile yarn; and a water shrinkable yarn inlaid in every course, said courses running circumferentially in said cover fabric, said wales running length-wise in said cover fabric, said cover fabric exhibiting a substantially circumferential shrinkage after immersion in water.

4,531,387

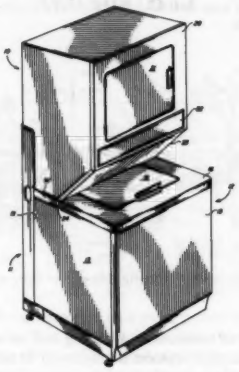
COMBINATION APPLIANCE WITH SLIDING DOOR

Curran D. Cotton; David I. Ellingson; William J. Noe, and James D. Wilson, all of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1983, Ser. No. 565,731
Int. Cl.³ D06F *29/00*
U.S. Cl. 68—3 R **7 Claims**

1. A combination appliance comprising: a fabric washer including an enclosure having a generally horizontally disposed top cover defining an access into said fabric washer; a fabric dryer supported generally above the fabric washer and positioned with a rearwardly overhanging relationship thereto to define a compartment below the fabric dryer and behind the fabric washer; slidable panel means associated with said top

cover; means including a portion of said top cover and a lower portion of said fabric dryer for mounting said panel means on said top cover and for defining a generally horizontal pocket extending rearwardly into communication with said compartment, said slidable panel means being movable in a generally



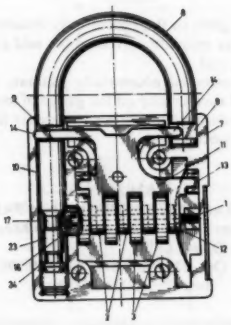
horizontal plane between a first forward position covering said fabric washer access and a second rearward position disposed generally below said fabric dryer and extending into said compartment for exposing said fabric washer access; and means for retaining said slidable panel means in association with said top cover in said first and second positions.

4,531,388

CHANGE CODE SYSTEM IN COMBINATION PADLOCKS

Jose I. P. Garro, Gastanaduy, 11-22, Escoriaza (Gipuzcoa), Spain

Filed Mar. 15, 1983, Ser. No. 475,453
Claims priority, application Spain, Jul. 26, 1982, 514.373
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—25 **7 Claims**



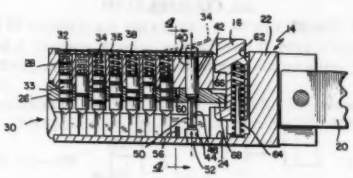
1. A combination padlock of the type having a housing, a shackle, code wheels mounted on a shaft in the housing and a bushing associated with each code wheel on the shaft, the padlock combination being changed by relative rotation between the code wheel and the bushings, said bushings being in end to end relationship, means biasing said bushings toward one end of the shaft and into engagement with the code wheels, said shaft being axially fixed in relation to the housing and the code wheels, and said bushings being movable axially on the shaft to become disengaged from the code wheels by movement on the shaft against the force of the biasing means, and means for causing such movement of the bushings by engagement with the bushing at the end of the shaft opposite the biasing means.

4,531,389

CABINET LOCK

William R. Foshee, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Dec. 10, 1982, Ser. No. 448,477
Int. Cl.³ E05B *15/00*
U.S. Cl. 70—372 **16 Claims**



1. A cabinet lock or the like comprising

a lock body having a key plug bore and a plurality of pin tumbler bores extending therefrom to an exterior surface of the body,

a cap receiving groove in said surface and crossing said bores,

a cap received in said groove for closing the outer ends of said bores,

said groove having side walls retainingly engaged with said cap at a plurality of points along the length of the groove,

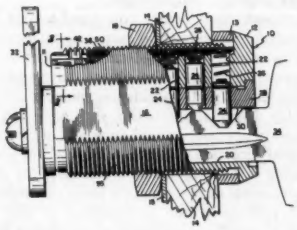
said body including a passage terminating in said groove below said cap for the reception of means to force at least a portion of said cap out of the groove so as to permit removal of the cap to expose the bores for recombination.

4,531,390

LOCK CAPPING

Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Mar. 2, 1983, Ser. No. 471,277
Int. Cl.³ E05B *15/00*
U.S. Cl. 70—372 **17 Claims**



1. A pin tumbler lock comprising

a lock body having a key plug bore and a plurality of tumbler pin bores extending therefrom,

a cap-receiving groove in said body and crossing the outer ends of bores, said groove having undercut sides and overlying side flanges extending toward each other at the sides of the groove, and

a cap in said groove having a central portion overlying said pin tumbler bores and having a pair of oppositely extending edge portions, at least one of the edge portions including a side member depending from the central portion to

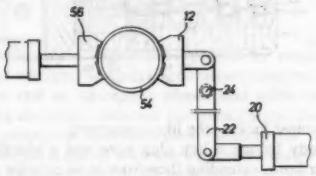
define a distal edge and an offset member extending outwardly from the distal edge of the side member to engage its companion side flange to retain the cap in place in the groove.

4,531,391

ADAPTIVE METHOD AND APPARATUS FOR CORRECTING DEVIATIONS IN THE SHAPE OF OBJECTS

Guy R. Engman, Ärla, Sweden, assignor to AB Thorns Mekaniska Verkstad, Spanga, Sweden

Filed Mar. 24, 1982, Ser. No. 361,142
Claims priority, application Sweden, Apr. 1, 1981, 81020893
Int. Cl.³ B21B *37/00*
U.S. Cl. 72—10 **10 Claims**



6. An apparatus for correcting deviation of a plastically deformable object from a desired shape, said apparatus comprising;

(A) at least one measurement transmitter for sensing the real shape of an object and delivering a corresponding output signal;

(B) a data processing unit connected to said measurement transmitter for receiving said output signal;

(C) a memory connected to said data processing unit and adapted to store a predetermined relationship between deviation in the shape and correction length, said data processing unit being adapted to store information about the desired shape of the object for comparison of the sensed shape of the object represented by said output signal from said measurement transmitter with the desired shape of the object for determining the deviation in the shape, and from said relationship stored in said memory determining the size of the correction length corresponding to said determined deviation of the shape, and delivering a corresponding output signal;

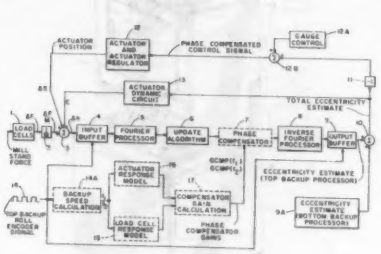
(D) and a straightening device connected to said data processing unit for receiving said output signal therefrom and comprising at least one straightening member to carry out a corrective forming of the object determined by said correction length, said straightening member comprising a hydraulicly driven straightening shoe arranged between two supports opposite to said shoe and separated in the longitudinal direction of the object, said supports being displaceable in the longitudinal direction of the object and said displacement of said supports being controllable from said data processing unit to positions of said supports along the longitudinal direction of the object which are optimal for the shape correction in question; said measurement transmitter being arranged to sense the real shape of the object after the straightening operation and deliver to said data processing unit a second output signal for determining possibly remaining deviation in the shape of the object after the straightening operation, said data processing unit being arranged to then form the difference between the deviation in the shape before and after said straightening operation and change said predetermined relationship stored in said memory by multiplication of the actual correction length by a factor reciprocally proportional to said difference.

4,531,392

PHASE COMPENSATOR FOR GAUGE CONTROL USING ESTIMATE OF ROLL ECCENTRICITY

Mark E. Puda, Churchill Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 19, 1984, Ser. No. 591,277
Int. Cl.³ B21B *37/12*
U.S. Cl. 72—10 **1 Claim**



1. A method of controlling a rolling mill in which a gauge measuring and control system is employed to offset the effects of eccentricity of one or more of the rolls of a mill stand, and of increasing the range of mill speeds over which the gauge control system can maintain stable operation, the method comprising the steps of:

storing models of (1) the dynamic response of force transducers that measure the force at which the rolls engage material in the mill, and (2) the position response of actuator mechanisms of the mill that provide the force,

measuring fundamental and harmonic frequencies of any eccentricity of the rolls during rotation thereof,

estimating roll eccentricity at the measured frequencies,

utilizing said frequencies and stored models of force transducer and actuator position responses to determine any amplitude changes and phase shifts occurring in measured force and in signals that control the acuator mechanisms due to the lag in responses of the force transducers and actuator mechanisms at these frequencies,

combining the amplitude changes and phase shifts of the previous step to provide a set of gains that compensate for phase errors caused by the amplitude changes and phase shifts,

applying these gains to the eccentricity estimate to provide an eccentricity estimate corrected for said amplitude and phase errors, and

utilizing said corrected eccentricity estimate to offset the effects of roll eccentricity on the gauge of material exiting the mill by ordering appropriate changes in the position of the actuator mechanisms.

4,531,393

ELECTROMAGNETIC FORMING APPARATUS

Donald B. Weir, San Diego, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Oct. 11, 1983, Ser. No. 540,795
Int. Cl.³ B21D *26/14*
U.S. Cl. 72—56 **5 Claims**

1. Electromagnetic forming apparatus comprising in combination.

frame means including a pair of frame members mounted on the frame for movement relative to each other,

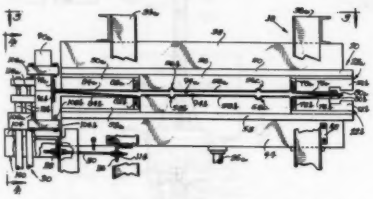
a pair electrically conductive, elongated shaper halves, each supported by a frame member and each having at least one forming recess therein,

actuator means for moving at least one of said frame members and the shaper half thereon between an open position to receive workpiece in said recesses and a closed position,

a first pair of flexible conductors connected to first ends of each of said shaper halves and a second pair of flexible

conductors connected to opposite second ends of the shaper halves,

said second pair of flexible conductors being electrically continuously connected when said shaper halves are in their open and closed positions and cooperating with said first pair of flexible conductors to provide a continuous electrical circuit between the halves and to establish the



single turn coil when the shaper halves are in the closed position,

and means for connection to a pulse power supply and connected to the first ends of said flexible conductors so as to establish an electrically closed conductive circuit through the flexible conductors and shaper halves while in the open and closed positions to facilitate selective application of a power pulse to said single turn coil.

4,531,394

SIX-HIGH ROLLING MILLS

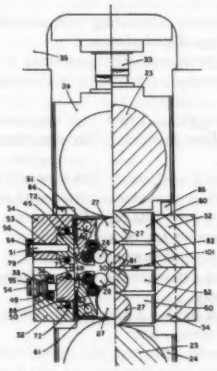
John W. Turley, Oxford, and Michael G. Sendzimir, Woodbury, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 362,460, Mar. 26, 1982, abandoned. This application Mar. 10, 1983, Ser. No. 474,009

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.³ B21B *31/10, 29/00*

U.S. Cl. 72—238 **13 Claims**



1. In a side-supported six-high rolling mill of the type having a pair of housings, a pair of small vertically in-line free-floating work rolls and vertically in-line chock-mounted back-up rolls with chock mounted intermediate rolls located in-line and between said work rolls and said back-up rolls, lateral support roll assemblies mounted on each side of each work roll and support means for each of said lateral support roll assemblies, said lateral support roll assemblies being chosen from the class consisting of a single side support roll, and a single side support roll together with a pair of backing roll assemblies, the improvement wherein each of said support means for each of said lateral support roll assemblies comprises a support arm mounted upon said chocks of the adjacent one of said intermediate rolls, said mounting allowing horizontal adjustment of said lateral support roll assembly, a spacer to adjust the horizontal position of said lateral support roll assembly; and a stationary side support beam assembly, which provides rigid support for said spacer and said support arm.

4,531,395

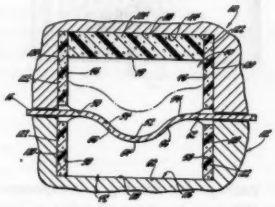
MODULAR DRAWBEAD STRUCTURE

Richard J. Dusman, Warren, and Harmon D. Nine, Fraser, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 523,973, Aug. 17, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,428

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—350 **11 Claims**



1. A drawbead structure for a pair of die binders which close relative to each other and to a blank during press operation comprising, in combination,

each die binder having an elongated outwardly opening slot therein, the slots being generally aligned when the binders close relative to each other,

a male drawbead module located in one slot and a female drawbead module located in the other slot,

the male module including a body portion having a base wall, an outer wall and side walls, and a bead portion projecting from the outer wall of the body portion and merging into such outer wall across concave shaped shoulders, the base and side walls of the body portion matching respective walls of the one slot but spaced therefrom,

the female module including a body portion having a base wall, an outer wall and side walls, and a groove portion projecting within the body portion from the outer wall and merging into such outer wall across convex shaped shoulders, the groove portion interfitting with the bead portion and the convex shoulders opposing the concave shoulders, the base and side walls of the body portion of the female module matching respective walls of the other slot,

first resilient means located between the base wall of at least one of the female and male modules and the base wall of a respective slot to set the spacing between the interfitting groove and bead portions and opposing shoulders of the modules and thereby set the drawbead restraining force and absorb shock loads when the modules are engaged against a blank,

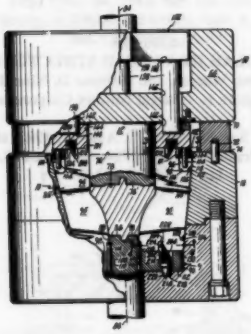
and second resilient means between the side walls of the modules and like walls of a respective slot to permit limited self-centering movement of the modules laterally of a respective slot upon closure of the module against a blank.

4,531,396

FORGING DIE PACKAGE

Donald G. MacNitt, Jr., Singer Island; Raymond M. Walker, Port St. Lucie, and Bryant H. Walker, Stuart, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 26, 1983, Ser. No. 498,240
Int. Cl.[3] B21D 31/00
U.S. Cl. 72—354 6 Claims



1. A die package for forging a component comprising a central disc structure having a plurality of integrally formed appendages extending therefrom, said die package having a central axis and comprising:

(1) a first forging die of generally cylindrical geometry having a cylindrical outer surface and a top surface formed to the inverse geometry of one side of the central disc structure;

(2) a cylindrical array of circumferentially adjacent die segments stationary relative to said first forging die, each segment having

(a) a pair of substantially oppositely facing side walls in abutting relationship with the side walls of the adjacent segments and being contoured to form therewith a plurality of circumferentially spaced cavities of the inverse geometry of the appendages to be formed, wherein each side wall also includes a recess having a flat, axially and radially extending surface portion, said surface portion being opposed to, parallel to, and spaced apart from said surface portion of an abutting side wall defining a slot therebetween, said slot extending axially to said upper surface;

(b) a radially outwardly facing outer surface,

(c) an inner arcuate cylindrical surface contacting said outer surface of said first forging die,

(d) a bottom surface,

(e) an upper surface,

(3) stabilizer means comprising a rigid support member surrounding said axis and disposed on said upper surfaces and overlying said slots, and a plurality of circumferentially spaced apart pins fixidly secured to said support member, one of said pins extending into each of said slots and fitting tightly between said opposed surface portions thereof, each slot extending radially inwardly beyond its respective pin to allow radially outward movement of said die segments relative to said pins after forging; and

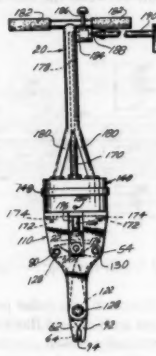
(4) radial restraint means in engagement with each of said die segments to prevent radially outward movement thereof.

4,531,397

CRIMPING TOOL

Rodger Pratt, 5436 106th Ave. NE., Kirkland, Wash. 98033

Filed Dec. 2, 1983, Ser. No. 557,334
Int. Cl.[3] B21J 9/18
U.S. Cl. 72—451 16 Claims



1. A crimping tool comprising:

a. a fluid actuated cylinder;

b. a moveable piston in said fluid actuated cylinder;

c. a rod connecting with said piston and part of said rod being outside of said fluid actuated cylinder;

d. a frame comprising a base, a first leg and a second leg;

e. said first leg and said second leg being spaced apart;

f. a first slot in said first leg;

g. a second slot in said second leg;

h. a plunger positioned in and moveable in said first slot and in said second slot;

i. said plunger having a base, a first leg and a second leg which are spaced apart;

j. said rod and said plunger operatively connecting together;

k. a passageway in said base and said rod being in said passageway;

l. a shaft operatively connecting with said first leg and with said second leg of said plunger;

m. a single toggle operatively connecting with said shaft;

n. a toggle operatively connecting with said shaft;

o. a link;

p. said single toggle and said link operatively connecting together to allow movement between them;

q. a single link;

r. said toggle and said single link operatively connecting together to allow movement between them;

s. a passageway in the first leg of said frame and a passageway in the second leg of said frame and a shaft in said passageways identified as a frame shaft;

t. said link having a passageway and said frame shaft being in said passageway;

u. said single link having a passageway and said frame shaft being in said passageway;

v. said link extending beyond said frame shaft into a base;

w. said single link extending beyond said frame shaft into a narrow arm;

x. said base of said link and said narrow arm upon being juxtapositioned functioning to crimp an object;

y. means operatively connecting together said first actuated cylinder and said base; and,

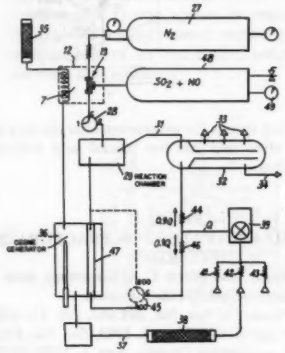
z. a means for the introduction of fluid under pressure to said first actuated cylinder to move said piston to move said toggle and to move said single toggle so as to move said link and to move said single link toward each other and near each other to position said base of said link and said narrow arm of said single link adjacent to each other.

4,531,398

CALIBRATION SYSTEM FOR GAS ANALYZERS

Dominique Di Benedetto, and Jean-Claude Marchand, both of Saint-Etienne, France, assignors to Association pour la Recherche et le Develloppement des Methodes et Processus Industriels-A.R.M.I.N.E.S., Paris, France

Filed Jul. 18, 1983, Ser. No. 515,034
Claims priority, application France, Jul. 27, 1982, 82 13104
Int. Cl.[3] G01D *18/00*; G01M *19/00*
U.S. Cl. 73—1 G 5 Claims



1. A calibration system adapted for use with gas analyzers, and particularly for use with apparatus for measuring atmospheric pollution and for detecting gaseous pollutants, said system comprising:

(a) a sealed permeation chamber and a source of at least one gaseous pollutant connected to said permeation chamber;

(b) a permeation tube extending across said chamber, said tube being formed from a material which is permeable to said at least one gaseous pollutant, a first end of said permeation tube being connected to a source of pure pressurized vector gas and a second end of said tube being fluidically connected to a mixer, said mixer being connected to a source of dilution zero air;

(c) means for regulating the temperature within said permeation chamber, said temperature regulating means thus comprising means for maintaining a predetermined constant temperature within said permeation chamber, said permeation chamber being substantially cylindrical and having two end faces, said end faces comprising inlet and outlet unions, respectively; and

(d) metal tubes locked by nuts, said metal tubes extending through respective ones of said inlet and outlet unions, said metal tubes extending coaxially within said cylindrical chamber and having ends which are welded to an intermediate tube having a smaller diameter, said intermediate tube being formed from stainless steel and being pierced over at least a portion of its length by a plurality of holes, said permeation chamber extending around said intermediate tube.

4,531,399

METHOD OF CALIBRATING PRESSURE SENSOR

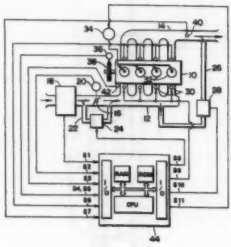
Shigeo Aono, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,761
Claims priority, application Japan, Jan. 26, 1983, 58-9930
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—4 R 8 Claims

1. In an internal combustion engine having a piston operatively connected with a crankshaft and movably disposed in a cylinder to define a combustion chamber and a sensor for sensing the pressure prevailing in said combustion chamber, a method of calibrating said sensor comprising the steps of:

sensing the pressure in said combustion chamber using said sensor;

measuring the amount of air being inducted into said combustion chamber;



determining, using the pressure sensed by said pressure sensor, a factor which is proportional to the amount of air inducted into said combustion chamber;

comparing said determined factor with a standard factor to determine the difference therebetween; and

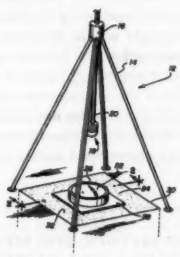
calibrating the output of said sensor using said difference.

4,531,400

METHOD AND APPARATUS FOR ICE IMPACT TESTING

Donald E. Nevel, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,303
Int. Cl.[3] G01N *3/30*, *3/48*
U.S. Cl. 73—12 9 Claims



1. A device for testing ice samples comprising:

impact device for imparting a force to the ice sample;

structure means for releasably holding and generally guiding said impact device;

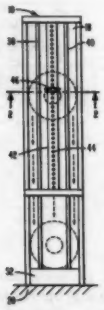
frame means positioned within said structure means below said impact device for receiving the ice sample including a ring for providing biaxial support to the ice sample and a backing sheet coupled to said ring to provide a third axial support, and base means for providing support for said backing sheet, said frame means simulating a semi infinite mass.

4,531,401

IMPACT TEST APPARATUS

Jordan R. Nelson, Pennington, and Remo A. Funari, Trenton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 23, 1983, Ser. No. 564,914
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **6 Claims**



1. An apparatus for testing the guided free fall impact strength at a point on the outer diameter of an aerodynamically unstable disc shaped article of a predetermined diameter and a predetermined thickness, said apparatus comprising in combination:

a vertical guide means for directing the disc shaped article during testing in vertical guided free fall from a preselected height, said vertical guide means having a vertical substantially air impervious back support portion of at least said preselected height having a flat inner surface, a first guide rail and a second guide rail; said guide rails being positioned vertically on the flat inner surface spaced apart from each other by a given distance which is wider than the predetermined diameter of the article and extending outwardly from the inner surface by a given amount which is greater than the predetermined width of the article with the given distance and the given amount of extension being sufficient to provide lateral guidance during free fall of the article to maintain the fall direction of the article in a substantial vertical direction;

a holding means cooperatively engagable with the guide means for releaseably securing the disc shaped article at the preselected height within the guide means; and

impact means positioned at the bottom terminal end of the guide means for terminating the guided free fall of the disc shaped article after the disc shaped article has fallen the preselected height and thereby imparting to a point on the outer diameter of the disc shaped article substantially all of the impact force developed during the guided free fall.

4,531,402

APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF LARGE PARTICLES IN A GAS

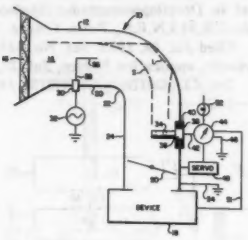
Robert B. Reif, Grove City, and Loren R. Albrechtson, Gahanna, both of Ohio, assignors to Battelle Development Corp., Columbus, Ohio

Filed May 2, 1983, Ser. No. 490,533
Int. Cl.³ G01N *15/02*
U.S. Cl. 73—28 **22 Claims**

1. Apparatus for measuring the concentration of large particles in a gas containing both large and smaller particles comprising:

a charge neutralizing device for neutralizing pre-existing charges on particles in said gas;

a triboelectric charging means for effecting triboelectric charging of said large particles in said gas after said gas has passed said charge neutralizing device; and



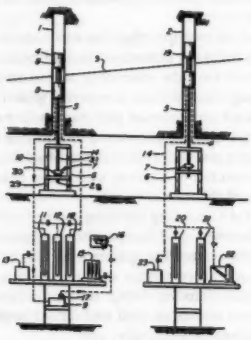
charge measuring means for measuring charges on particles in said gas after said gas has passed said triboelectric charging means.

4,531,403

METHOD AND APPARATUS FOR FRACTURATION DETECTION

Susan A. de Korompay, and Victor L. de Korompay, both of 119 Angell Ave., Beaconsfield, Quebec, Canada

Continuation-in-part of Ser. No. 282,862, Jul. 13, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 472,356
Claims priority, application Canada, Aug. 1, 1980, 357548
Int. Cl.³ G01N *15/08, 19/08*
U.S. Cl. 73—38 **18 Claims**



1. A method for detecting fractures and determining the degree of fracturation in a rock mass or concrete of known matrix permeability having at least one borehole therein, comprising:

(a) pressure sealing a selected length of a selected borehole;

(b) applying a negative fluid pressure to said selected length of said selected borehole; and

(c) measuring the fluid transmitting capacity of said rock mass through selected intervals along said borehole relative to matrix permeability.

4,531,404

FLOW CELL ASSEMBLY

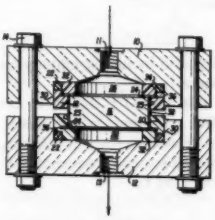
Craig H. Phelps, Dallas, and Krishnaswamy Sampath, Carrollton, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,727
Int. Cl.³ G01M *3/02*
U.S. Cl. 73—38 **7 Claims**

1. A flow cell assembly for studying fluid flow through disc-shaped samples therein comprising:

an inlet housing and an exit housing of similar size and shape in facing and spaced apart relationship, each having a central cut-out portion defining respectively an inlet and outlet chamber; each chamber having an annular outer peripheral margin in mutual general axial alignment when the housings are in said facing and spaced apart relationship; each annular inner margin having an axially extending inner face and a radially extending inner face;

means for holding a disc-shaped test sample between said housings comprising a ring to fit in each margin, each ring having a radially and axially outward first groove holding a deformable O-ring against its respective margin and a radially and axially inward second groove shaped to fit over the edge of said disc-shaped sample to hold it in place between said housings;



a flat gasket on the face of said second groove which faces the flat face of said disc for seating said gasket against the flat face of said disc, around the circumference thereof, there being one gasket for each ring;

fastening means to secure said housings together and biased toward each other;

the arrangement being such that the housings are held spaced apart when assembled in confronting relationship with a disc-shaped sample therebetween, the peripheral edge of said disc, at least in the portion not covered by said rings, having a coating of an epoxy sealant or a heat shrink material to prevent leakage of test fluid from said peripheral edge.

4,531,405

METHOD AND DEVICE FOR MEASURING THE LEVEL OF A FLUID INSIDE OF A CONTAINER

Peter Leister, Waldbronn, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,876

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206465

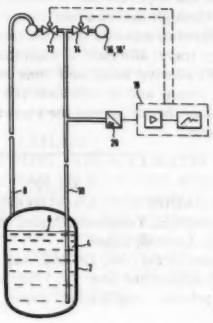
Int. Cl.³ G01F *23/00*

U.S. Cl. 73—290 V **20 Claims**

1. A method for measuring a level of a liquid in a container by producing natural vibrations, said container including a primary chamber and a measuring tube, liquid in said primary chamber being in communication with liquid in said measuring tube, said measuring tube including a column of liquid, said column of liquid defining a level and having a resonance frequency dependent upon said level of said liquid in said container, comprising, in combination:

oscillating said column of liquid held by said measuring tube by temporarily altering, with a vacuum, said level of said column of liquid at approximately said resonance frequency of said column of liquid, whereby said column of liquid oscillates with natural vibrations and said resonance frequency may be measured; and

measuring and analyzing a frequency of said natural vibrations of said column of liquid in said measuring tube to determine said level of said liquid in said container, said



measuring occurring above said level of said liquid in said measuring tube.

4,531,406

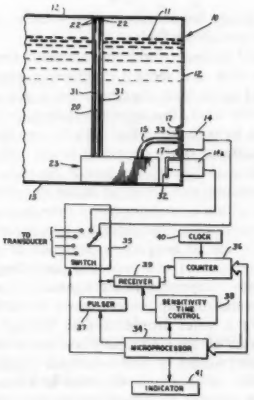
ULTRASONIC LIQUID QUANTITY MEASURING APPARATUS

Harold B. Fritz, Norcross, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 29, 1982, Ser. No. 437,805

Int. Cl.³ G01S *15/08*

U.S. Cl. 73—290 V **16 Claims**



1. An ultrasonic quantity measuring apparatus for liquid in a container having a bottom and a known size and shape comprising:

a source of ultrasonic energy located externally of said container;

at least one conveyor within said container having low ultrasonic propagation loss properties with a stabile dielectric constant, said at least one conveyor being a rod essentially of a thermoset cross-linked styrene copolymer with a metallic coat;

each said conveyor to direct the energy from said source located externally of said conveyor to a selected point adjacent the bottom of said container;

a conduit extending from each said selected point substantially perpendicular to the top surface of the liquid in said container;

an opening in each said conduit to permit liquid in said container to enter said conduit whereby said ultrasonic energy travels from said selected point through said conduit to the upper surface of said liquid where it is reflected back through said conduit;

clock means to measure the time required for the ultrasonic energy travel aforesaid in each said conduit; and other

means to receive each said time measurement from said clock means and to calculate the liquid quantity in said container therefrom and the known size and shape of said container.

4,531,407

FUEL GAUGE FOR AN AUTOMOTIVE VEHICLE

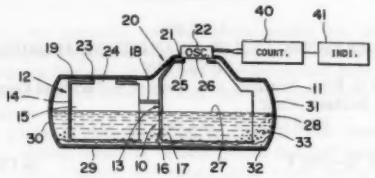
Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 292,164, Aug. 12, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 563,273

Claims priority, application Japan, Oct. 16, 1980, 55-146445[U]

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **15 Claims**



1. A fuel gauge for an automotive vehicle, comprising:

(a) a tank containing fuel;

(b) first and second conductive elements forming a capacitor, the first and second conductive elements being so arranged as to form therebetween a gap to be insulated from each other, the capacitor being located within the fuel tank so as to admit fuel into the gap thereof, whereby the capacitance of the capacitor varies with the position of the surface of the fuel, the gap of the capacitor being of a predetermined size allowing water droplets to fall out of the gap within a predetermined time period; and

(c) a structural means for reducing inaccuracies in fuel measurement due to temporary presence of water droplets within said gap of said capacitor, including

timing means comprising an arrangement of said conductive elements and the gap therebetween for defining said time period for a water droplet to pass through said gap, and

a measuring means electrically connected to the capacitor for determining a time-averaged capacitance of the capacitor over a time duration in excess of said time period, thereby to reduce effects of a temporary presence of water droplets within said gap.

4,531,408

CONTROL OF ROTOR BLADE STROBOSCOPIC DISPLAY

James R. Chadwick, Bradbury, and Lloyd N. Johnson, Glendora, both of Calif., assignors to Chadwick-Helmuth Company, Inc., El Monte, Calif.

Filed Dec. 6, 1982, Ser. No. 447,264

Int. Cl.³ G01M *1/28*; G01B *11/26*

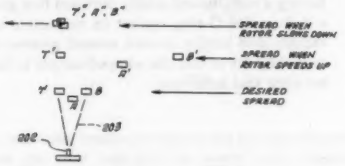
U.S. Cl. 73—455 **16 Claims**

1. In the method of determining out-of-track condition of the baldes of a rotor driven in rotation by a drive, the rotor and drive subject to transient forces that tend to vary angular frequency, the steps that include

(a) providing a display means and operating same to repeatedly display corresponding portions of the rotating blades to have selected spread positions in space, and

(b) adjusting the repetition rate of said displaying as a function of transient force induced variation in drive angular frequency caused by said transient forces, thereby substantially to maintain said selected positions in space,

(c) said (b) step including employing a first sensor located to sense the frequency f_1 of the drive at a location where $f_1 >> f_2$, f_2 being the angular frequency of the blade rotor,



(d) said (b) step also including employing a second sensor located to sense f_2,

(e) and using said sensed f_1 and f_2 to control the display means to have an output whose initial frequency, once each interval related to rotor revolution, is controlled by f_2, and whose subsequent frequency following said interval is controlled by f_1.

4,531,409

TEST SYSTEM FOR DEFECT DETERMINATION IN WELDING SEAMS

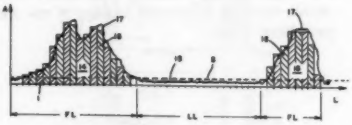
Friedrich-Otto Koch, Unna Massen, and Hans-Jürgen Wahl, Münster, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,082

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 8126298[U]

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—588 **11 Claims**



6. A method for non-destructive testing of metallic material comprising

testing a welding seam with ultrasonic equipment;

sensing ultrasonic defect signals according to the pulse-echo method;

digitizing the ultrasonic defect signals;

combining the digitized signals with signals corresponding to longitudinal position along the welding seam;

producing a defect curve from the data resulting from combining the digitized signals with the signals corresponding to the longitudinal position;

determining the length over which a defect signal is observed with the successive length over which no defect signal is observed;

comparing the length, over which a defect signal is observed with the n-fold of the length, over which no defect signal is observed;

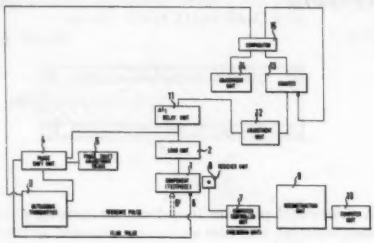
adding the length, over which a defect signal is observed, to the preceding length, over which a defect signal was observed; and

repeating these steps with the generated total length, over which defects are observed until a larger length, over which no defect signals are observed, occurs, where n can assume the values 0.5, 1, 2, 3, 4, . . . x; where x is an integer.

4,531,410
METHOD OF AND APPARATUS FOR DETECTING FLAWS INSIDE ARTICLES, MORE PARTICULARLY STRUCTURAL COMPONENTS, BY MEANS OF ACOUSTIC HOLOGRAPHY

Horst-Artur Crostack, Beringweg 2, 5860 Iserlohn, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,414
Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217530; May 10, 1982, 8213515[U]
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—603 **9 Claims**

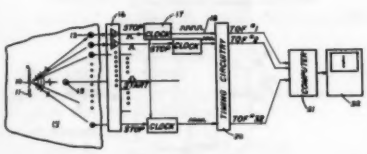


1. A method of detecting flaws inside articles, such as structural components, by acoustic holography, in which the flaw area to be detected is subjected to ultrasonic pulses on which, after reaction with the flaw, a reference beam is superimposed, whereupon the resulting interference field is holographically detected, reconstructed and evaluated, characterized by applying a load to the flaw area and subjecting the flaw area to ultrasonic pulses at least at two different times of the loading (minimum and maximum in the case of cyclic loading, before the loading and at maximum loading in the case of single loading), the ultrasonic pulses being short with respect to the period of the loading and, after reaction with the flaw, superimposing reference pulses (I_R) on said ultrasonic pulses, changing the relative phase between the flaw pulse (I_F) and the reference pulse (I_R) by a predetermined amount between the individual sonic applications to the loaded flaw whereupon superimposing the holograms of these sonic applications to the flaw to form an interferogram which can be evaluated.

4,531,411
ACOUSTIC EMISSION LINEAR PULSE HOLOGRAPHY

H. Dale Collins; Lawrence J. Busse, both of Richland, and Douglas K. Lemon, West Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 25, 1983, Ser. No. 545,426
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—603 **5 Claims**

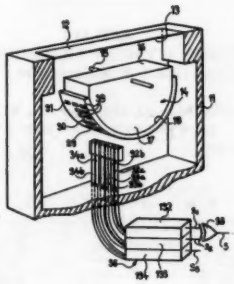


1. A method for monitoring growing defects in an inspection zone within a structure, comprising the following steps:
mounting a plurality of discrete sensors, including a reference sensor, at fixed locations in a preselected array along a surface of the structure adjacent to the inspection zone;
detecting the acoustic waves emitted from a growing defect in the inspection zone as output pulses generated at each sensor;
determining the phase components of the output pulse generated at each sensor at a selected time as a function of the pulse transmission time between the sensor and the reference sensor and as a function of a synthetic frequency selected from the pulse bandwidth; and
combining the resulting cumulative phase information into a synthetic hologram of the defect.

4,531,412
ULTRASONIC PROBE FOR ACCURATELY DETERMINING ANGULAR POSITION AND AN ECHOGRAPHY APPARATUS USING SUCH A PROBE

Lucien Prud'hon, and Robert Bele, both of Meaux, France, assignors to CGR Ultrasonic, Paris, France

Filed Jun. 24, 1983, Ser. No. 507,454
Claims priority, application France, Jun. 29, 1982, 82 11398
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—621 **19 Claims**



1. An ultrasonic probe comprising:
rotating mobile assembly means for performing sectorial scanning with an ultrasonic wave;
at least one angular location track formed on said mobile assembly means and inscribed with pulsed location data arranged in a succession of pulses, said angular location track describing a certain path determined by the movement of said mobile assembly; and
means for reading said pulsed data disposed opposite a point on said path to determine the angular position of said mobile assembly means.

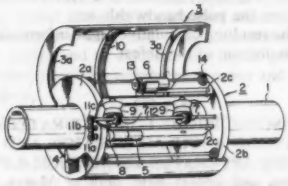
4,531,413
ULTRASONIC FLAW DETECTOR DRIVING APPARATUS OF A TRACKLESS TYPE

Kenji Tsuchita, Hitachiota; Kozo Domon, Hitachi, and Fuminobu Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,694
Claims priority, application Japan, Sep. 29, 1982, 57-170172
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—637 **9 Claims**

1. An ultrasonic flaw detector driving apparatus of a type having no guide rail and enabling inspection of piping to be achieved, comprising:
a traveling member capable of being removably mounted on an outer peripheral surface of the piping; and
a turning member detachably mounted to an outer peripheral surface of the traveling member;
wherein the traveling member is equipped with a multiplicity of sets of traveling rolling elements located in position on an outer peripheral surface of the piping spaced apart from one another circumferentially of the piping while each set of traveling rolling elements comprises at least two rolling

elements which are in contact with the outer peripheral surface of the piping and spaced apart from each other axially of the piping so that as the traveling rolling elements are rotated the traveling member can travel axially of the



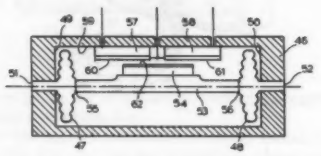
piping on the outer peripheral surface thereof, and wherein the turning member is equipped with at least one ultrasonic wave probe for effecting scanning to perform inspection of the piping and capable of turning about the traveling member circumferentially of the piping.

4,531,414

LINEAR DISPLACEMENT TRANSDUCER DEVICE

Robert A. Kraus, 1636-T E. Edinger Ave., Santa Ana, Calif. 92705

Filed May 21, 1984, Ser. No. 612,335
Int. Cl.³ G01D *5/34*; G01L *7/06*
U.S. Cl. 73—705 **5 Claims**



1. A transducer device for translating increments of linear displacement by means of opto-electronic sensing into proportional increments of units expressed in volts;

said device comprises in combination housing means having first and second interdependent components, said first interdependent component comprises first and second radiation sensing element each having first and second electrical connection, and each having a planar, radiation sensitive surface defined by four corners of right angular configuration, said first and said second radiation sensitive surface being disposed in tandem, at a co-planar relationship adjacent to one another;

a second interdependent component, comprising first and second electrical connection, and a planar, radiation emissive surface defined by four corners of right angular configuration, said surface having an uniformly over its active area distributed radiation pattern;

said radiation emissive surface being disposed opposite to, and facing said first and said second radiation sensitive surface at a closely spaced, parallel relationship;

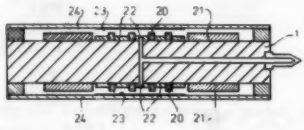
means for providing relative movement between said first and second interdependent components, being disposed within said housing means so as to move intrinsically to a position, where said radiation emissive surface faces opposite to at least one half of said first and opposite to at least one half of said second radiation sensing surfaces, and being disposed so that it may be influenced by external means to change position through stations of infinite resolution relative to said first and said second radiation sensitive surfaces, wherein at maximum change in position, a major portion of said radiation emissive surface faces a major portion of said first radiation sensitive surface, and a minor portion of said radiation emissive surface faces the minor portion of said second radiation sensing surface.

4,531,415

DIFFERENTIAL PRESSURE TRANSDUCER

Reiner U. Orlowski, Quickborn; Rolf U. D. Kobs, Tornesch, and Manfred R. Liehr, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1983, Ser. No. 541,945
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238430
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—718 **2 Claims**



2. A differential pressure transducer comprising a body of insulating material; two film electrodes disposed on the body; two electrically conductive diaphragm electrodes each comprising an insulating diaphragm formed from a ceramic material having the same composition as said body of insulating material, and a film electrode on an inner side of the diaphragm facing the body, whereby said body and said diaphragms have the same thermal behavior, said diaphragm film electrodes being arranged so as to form a capacitance in conjunction with respective film electrodes, said capacitance being dependent on the diaphragm deflection; and means for limiting relative movement of the diaphragm toward the body, said means comprising at least one support on a facing surface of at least one of said body and said diaphragms, extending toward the other of said body and said diaphragms; said body, film electrodes and diaphragm electrodes forming closed, interconnected cavities which are filled with a liquid,

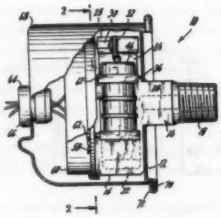
characterized in that said means comprises a plurality of said supports, said plurality including a plurality of projections formed of an insulating material and extending from said body through the film electrodes on the body.

4,531,416

PRESSURE TRANSDUCER

Kenneth Loewenstern, Langhorne; Daniel M. Clementi, Perkasie, and Glenn Kipp, Quakertown, all of Pa., assignors to Ametek, Inc., New York, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,139
Int. Cl.³ G01L *7/04*, *9/10*
U.S. Cl. 73—735 **8 Claims**



2. Apparatus for measuring the pressure of a fluid including in combination a dashpot, a core disposed within said dashpot, coil means supported on said dashpot pot, means responsive to variations in pressure for displacing said core within said dashpot, means including said coil means responsive to movement

of said core within said dashpot for providing an indication of the pressure of the fluid, and damping fluid contained within said dashpot for suppressing the harmonic resonances of said pressure responsive means.

4,531,417

HINGE-TYPE ANGLE SETTING DEVICE

Nils D. Hollman, Trollsländevägen 10, S-12537 Älvsjö , Sweden

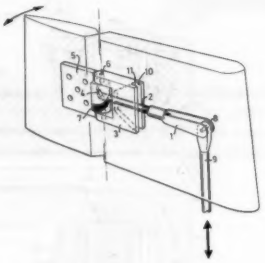
PCT No. PCT/SE81/00281, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/01230, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 29, 1981, Ser. No. 385,402

Claims priority, application Sweden, Sep. 29, 1980, 8006794

Int. Cl.³ F16H *21/54;* B64C *3/58*

U.S. Cl. 74—96 **4 Claims**



1. Angle setting device with a hinge joint defining a rotational axis, comprising

(a) a first member (3) provided with an actuator (1, 2) pivotally mounted at a point of attachment (4; 12) and limited in its movement in said first member by a first guide surface (10, 11); and

(b) a second member (5) rotatable about said rotational axis relative to said first member (3) by moving said actuator, said actuator being limited in its movement in said second member by a second guide surface (7) which forms an angle with said first guide surface, said limitation of movement by said second guide surface being arranged by said actuator (1) being journalled on the pin (4) fixed in said second member (5) and forming an angle with said rotational axis,

(c) said second member (5) being essentially fixed relative to said first member (3) in the direction of said rotational axis, whereby pivoting of said actuator causes relative rotational movement between said first and second members.

4,531,418

TOTALLY SYNCHRONIZED MANUAL TRANSMISSION UNITS FOR USE IN A VEHICLE

Yasuie Takahasi, and Shozi Haga, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 15, 1983, Ser. No. 532,480

Claims priority, application Japan, Nov. 1, 1982, 57-166865[U]

Int. Cl.³ F16H *3/38*

U.S. Cl. 74—339 **6 Claims**

1. A gear-shift mechanism for a manual transmission unit for use in a motor vehicle, comprising:

a housing assembly;

an input shaft for connection to an engine;

an output shaft supported in a parallel relationship to the input shaft within the housing assembly;

a forward input gear integrally attached to the input shaft;

a forward output gear rotatably mounted on the output shaft and constantly meshing with the forward input gear;

synchronizing means which are slidably mounted on one of the input and output shafts and rotatable therewith, said synchronizing means comprising a clutch means and a positive coupling means which engages the forward output gear;

first actuating means for shifting the synchronizing means toward or away from one of the forward input or output gears;

a reverse input gear integral with the input shaft;

an idler shaft supported in a parallel relationship with the input and output shafts within the housing assembly;

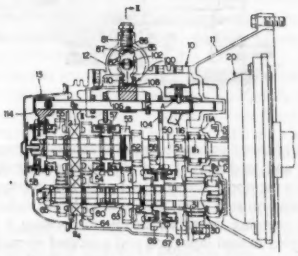
a reverse sliding gear mounted on the idler shaft;

a reverse output gear mounted on the output shaft;

second actuating means for shifting the reverse sliding gear into meshing engagement with the reverse input and output gears;

a manual shift lever for changing gearing ratios between the input shaft and the output shaft;

a fork shaft slidably supported in a parallel relationship with the idler shaft from the housing assembly and operatively connected to the manual shift lever for being selectively shifted by the operation between its neutral, forward and reverse positions;



a detent mechanism mounted in the housing assembly to retain selectively the fork shaft in its neutral or shifted positions when subjected to a resilient load acting thereon, the detent mechanism comprising a holder member slidable on the fork shaft and rotatable relative to the housing assembly, rotation of the holder member resulting in the movement of said synchronizing means, the holder member having a first projection and a slot for permitting the rotation of the holder member when shifting into reverse gear; and

rotating means rotatable by the manual shift lever, having a second projection, the second projection engaged with the first projection when the holder member slides upon shifting into reverse gear, rotation of the manual shift lever resulting the rotation of the holder member because of the engagement between the first projection and the second projection, resulting in coupling of the synchronizing means.

4,531,419

SERVO MECHANISM, ESPECIALLY FOR INTENSIFYING THE BRAKING POWER IN A MOTOR VEHICLE

Jakob Bötz, Ingersheim; Erich Mutschler; Hans Prohaska, both of Bietigheim-Bissingen; Eckhardt Schmid, Brackenheim, and Wolfgang Scholl, Gemmrigheim, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 21, 1981, Ser. No. 294,998

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031643

Int. Cl.³ F16H *35/00;* B60T *11/00;* F16B *7/00*

U.S. Cl. 74—388 PS **26 Claims**

1. Servo-mechanism apparatus for use between brake means and brake activating means for providing power assisted braking of a vehicle, comprising:

a housing;

a motor driven accessory drive means having a rotary output;

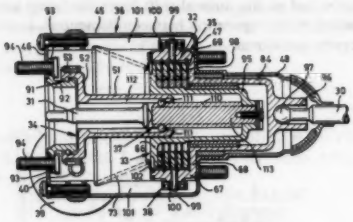
a push rod supported in said housing and comprising an input rod coupleable to said brake activating means and being axially displaceable by said brake activating means along the longitudinal axis of said push rod, and an output rod coupleable to said brake means and being axially displaceable along said axis, said input rod and said output rod being in substantially coaxial alignment;

said drive means comprising a driven wheel formed as a hollow cylinder in coaxial alignment with said push rod and being driven by said rotary output to rotate about said longitudinal axis, said output rod extending into said cylinder;

a servo member supported in said housing coaxial to said push rod for transferring force from said driven wheel to said output rod, said servo member comprising a displaceable pressure sensitive means arranged between said input rod and said output rod for determining the force said servo member exerts on said push rod in response to force exerted on said input rod by said brake activating means, said pressure sensitive means comprising a first element coupled to said input rod and a second element coupled to said output rod, said servo member further comprising a first movable joint coupling said driven wheel to one of said first or second elements and a second movable joint coupling the other of said first or second elements to said housing;

one of said first or second movable joints comprising a screw joint permitting screw like motion about said axis between the parts connected therewith;

the other of said first or second joints comprising a push joint permitting only relative axial motion along said axis between the parts connected therewith.



4,531,420

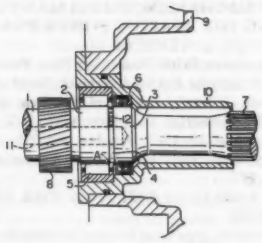
ROTARY SHAFT OF TRANSMISSION

Hajime Arai, Aichi; Shozi Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota City, Japan

Filed Dec. 29, 1982, Ser. No. 454,457

Int. Cl.³ F16H *57/04;* **B21D** *53/12;* **B21H** *1/14;* **B21K** *1/02*

U.S. Cl. 74—467 **1 Claim**



1. A rotary shaft having a bearing surface and an oil seal surface formed close to each other at a portion of a shaft body rotatably mounted in a case of a transmission, wherein a groove is circumferentially formed in said shaft body between said bearing surface which is super-finished and said oil seal surface which is abrasive-finished, to positively border between said bearing surface and said oil seal surface, and said shaft has an oil bore formed axially thereof in fluid communication with said circumferential groove.

4,531,421

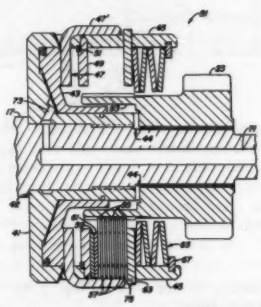
TRANSFER CASE OIL PUMP

Harold F. Vieth, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 6, 1983, Ser. No. 558,679

Int. Cl.³ F16H *1/44, 57/04*

U.S. Cl. 74—467 **5 Claims**



1. An improved transfer case containing hydraulic fluid and having a housing rotatably containing an input shaft, output shaft and at least one counter shaft, said shafts being rotatably mounted in said housing and each of said shafts carrying at least one gear thereon said gears being in constant mesh, clutching means for selectively clutching one of said gears to a respective one of said shafts to selectively provide driving communication between said input and output shaft, wherein the improvement comprises; a vane fixably mounted to one of said shafts such that said vane impacts and propells said hydraulic fluid when said hydraulic fluid exceeds a preselected level within said transfer case; a spout fixably mounted in said transfer case and located to receive said hydraulic fluid propelled by said vane; means for receiving hydraulic fluid from said spout remote to said transfer case.

4,531,422

TRANSMISSION SHIFT ROD INTERLOCK SYSTEM

James A. Yarnell, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio

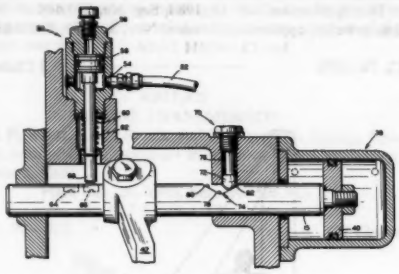
Filed Aug. 29, 1983, Ser. No. 527,460

Int. Cl.³ G05G *5/06;* **F15B** *15/26*

U.S. Cl. 74—475 **6 Claims**

1. In a transmission having a shift rod selectively movable between at least three positions including an intermediate neutral position, and air pressure means applied to an air cylinder for moving said rod between said positions; an improvement comprising: a plunger assembly for securing said rod against movement upon failure of said air pressure means to said plunger assembly comprising a pair of spaced detents in said rod, a plunger having an end selectively engageable with said detents, a first spring disposed for urging said end of said plunger toward and into one of said detents, and a piston positioned for holding said plunger end away from said detents against the force of said first spring whenever air pressure is applied to said piston; a poppet assembly for axially urging and holding said rod in said intermediate neutral position upon

interruption of said air pressure to said cylinder comprising a notch in said rod, said notch having a bottom portion and opposed cam surfaces on either side of said bottom portion, a poppet pin engageable with said notch, and a second spring



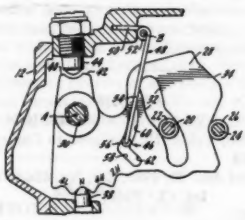
disposed for urging said poppet pin into engagement with said notch, whereby upon interruption of said air pressure to said poppet assembly, said second spring will force said poppet pin along one of said cam surfaces and into said bottom portion of said notch.

4,531,423

SPRING-ASSISTED SHIFT APPARATUS

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 6, 1983, Ser. No. 539,452
Int. Cl.³ G05G *5/10, 9/12*
U.S. Cl. 74—475 **5 Claims**



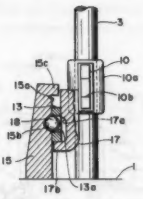
1. In spring-assisted shift apparatus including a plate rotatable about an axis to a plurality of positions, said plate defining at least one cam track, and at least one cam follower operatively associated with said one cam track and adapted to move an associated shift fork in response to selective rotation of said plate to said positions; the improvement comprising a spring-assist mechanism including an assist cam track defined by said plate, said assist cam track having an arcuate first track surface with a center of curvature on said axis, and a second track surface oriented such that a line perpendicular thereto does not intersect said axis, a spring member, and an assist cam follower supported by said spring member in operative association with said assist cam track such that said assist cam follower is in contact with said first track surface when said plate is in one position and in contact with said second track surface when said plate is in another position, said mechanism being constructed and arranged such that said spring member is stressed so as to apply a preload biasing force on said plate when said assist cam follower is in contact with said first track surface.

4,531,424

GEAR SHIFT MECHANISM FOR TRANSMISSION

Kazuyoshi Hiraiwa, Atsugi, and Akio Kawaguchi, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Sep. 29, 1982, Ser. No. 428,226
Claims priority, application Japan, Oct. 26, 1981, 56-170097
Int. Cl.³ G05G *9/02; B60K 20/02*
U.S. Cl. 74—477 **7 Claims**



1. A gear shift mechanism for a transmission comprising:

shift rod means comprising a shift rod which is axially movable, in accordance with a movement of a gear shift hand lever, from its neutral position in one axial direction to its first operative position and in the opposite direction to its second operative position, and pushing means integral with said shift rod,

first shifter means for shifting a first sliding member in a gear train of the transmission to effect a gear shift, said first shifter means being swingable on a fulcrum fixed to a case of the transmission from its neutral position in which the first sliding member is held in its neutral position, to its shift position in which the first sliding member is held in its driving position, said first shifter means being caused to swing from its neutral position to its shift position by said pushing means when said shift rod moves from its neutral position to its first operative position, and

interlocking means which is movable in and out of its interlocking position and interlocks said shift rod and said first shifter means when it is in its interlocking position, said interlocking means being held in its interlocking position when said first shifter means is away from its neutral position so that said interlocking means causes said first shifter means to swing from its shift position to its neutral position when said shift rod moves from its first operative position to its neutral position, and said interlocking means being held out of its interlocking position when said shift rod is between its neutral position and its second operative position.

4,531,425

REVERSE GEAR SELECTOR MECHANISM WITH MEANS FOR PREVENTING TRANSMISSION SLIPPING OUT OF REVERSE GEAR

Kohtei Takahashi, Sagamihara, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Apr. 19, 1983, Ser. No. 486,447
Claims priority, application Japan, May 6, 1982, 57-75790
Int. Cl.³ G05G *5/10, 9/12*
U.S. Cl. 74—477 **6 Claims**

1. A reverse gear selector mechanism in a transmission having a case and a reverse idler gear movable between a first shift position where it is incapable of carrying power and a second shift position where it is capable of carrying power, said mechanism comprising:

a striking rod rotatably and axially movably mounted on said transmission case;

a striking lever carried on said striking rod and having a finger;

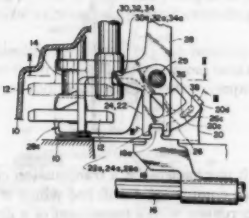
a shifter bracket fixedly mounted on said transmission case and having a side flange;

a pivot pin attached to said side flange;

a shift fork pivotally mounted on said pivot pin and arranged

to partially overlie said shifter bracket side flange, said shift fork being operatively connected with said reverse idler gear and operative to move same into said first and second shift positions when rotated about said pivot pin;

a shifter pivotally mounted on said pivot pin and arranged to partially overlie said shift fork, said shifter being engageable with said finger of said striking lever and rotatable about said pivot pin when said striking rod is axially moved; and



means for drivingly connecting said shifter with said shift fork to allow them to rotate together and for locking said shift fork with said shifter bracket side flange when said reverse idler gear is in said second shift position, the locking engagement between the shift fork and the shifter bracket side flange being releasable only when the shifter is rotated to drive the shift fork.

4,531,426

SUPPORTING STRUCTURE FOR A STEERING APPARATUS OF THE RACK AND PINION TYPE

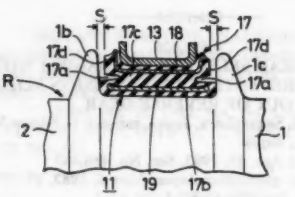
Yoshitaka Iijima, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 25, 1983, Ser. No. 545,225

Claims priority, application Japan, Oct. 29, 1982, 57-190623

Int. Cl.³ B62D *1/20*

U.S. Cl. 74—498 **12 Claims**



1. A supporting structure for a steering apparatus of the rack and pinion type comprising a rack axle supporting member which includes a rack tube and a gear housing adapted to axially movably support a rack axle, a mounting insulator provided around said rack axle supporting member, a clamping member around said mounting insulator for supporting said rack axle supporting member onto a vehicle body via said insulator, said mounting insulator comprising a first elastic means adapted to receive axial displacement forces applied to said rack axle supporting member by means of shearing stress and a second elastic means adapted to receive axial displacement forces applied to said rack axle supporting member by means of compressive stress.

4,531,427

APPARATUS WITH A PLANETARY GEAR SET

Sven W. Nilsson, Partille, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

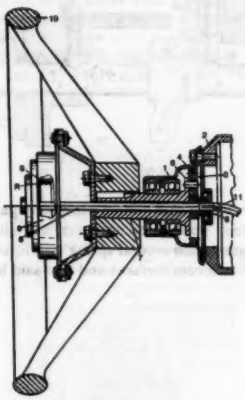
Continuation of Ser. No. 259,076, Apr. 30, 1981, abandoned.

This application Feb. 13, 1984, Ser. No. 579,446

Claims priority, application Sweden, Nov. 8, 1980, 8005643

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—675 **3 Claims**



1. The combination comprising a planetary gear set including a sun wheel, a gear ring circumscribing the sun wheel non-rotatably mounted in a gear housing and at least one planet wheel in cooperating engagement with the sun wheel and gear ring and disposed therebetween, a torque transmitting device including a stator and a rotor, a first shaft connected to said stator and said planet wheel and a second shaft connected to said rotor and sun wheel and an external rotatable member, said first shaft operable to take up the reactive torque in the torque transmitting device.

4,531,428

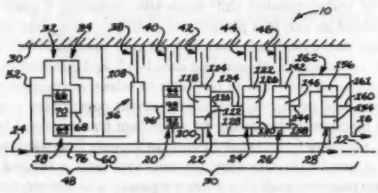
PLANETARY TRANSMISSION

Willis E. Windish, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 10, 1983, Ser. No. 456,937

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—765 **20 Claims**



1. A planetary transmission having an input member and an output member, comprising:

a first planetary gear set having a first sun gear, a first ring gear, and a first planet carrier;

a second planetary gear set having a second sun gear connected to the input member, a second ring gear connected to the first sun gear, and a second planet carrier connected to the output member for joint rotation;

coupling means for connecting the first and second planet carriers for joint rotation, the coupling means being at least partly disposed radially outwardly of the second planetary gear set; and

first means for selectively holding the second ring gear stationary and causing the output member to be driven in a forward mode of operation in response to rotation of the input member.

4,531,429

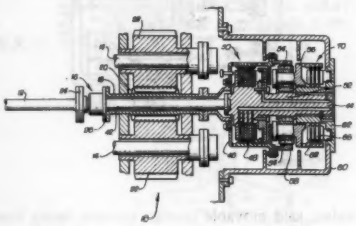
MARINE TRANSMISSION

Donald P. Shutt, Long Beach, and Thurman W. Jessup, Lynwood, both of Calif., assignors to Westech Gear Corporation, Lynwood, Calif.

Filed Jun. 20, 1983, Ser. No. 505,923

Int. Cl.³ F16H *3/44, 57/10*

U.S. Cl. 74—792 **20 Claims**



1. A marine transmission capable of operating in normal ahead, manuever ahead and reverse modes, comprising:

an input shaft;

an output shaft;

positive engagement clutch means for rigidly connecting said input shaft to said output shaft, thereby causing said transmission to operate in said normal ahead mode;

first modulated engagement means for connecting said input shaft to said output shaft, thereby causing said transmission to operate in said manuever ahead mode;

second modulated engagement means for operatively connecting said input shaft to said output shaft, thereby causing said transmission to operate in said reverse mode; and

direction reversing means associated with one of said slip clutches for causing said shafts to rotate in opposite directions.

4,531,430

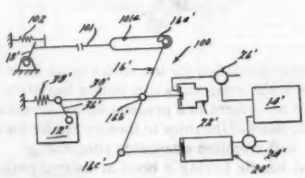
THROTTLE MODULATOR

Russell C. Holmes, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,668

Int. Cl.³ B60K *41/04;* **F02D** *11/04*

U.S. Cl. 74—858 **14 Claims**



1. A mechanism adapted to be interposed between an engine throttle pedal and an engine fuel control device for varying fuel delivery to an engine during shifting modes of a transmission driven by the engine, the mechanism comprising;

a rigid elongated member having first and third end portions each disposed for pivotal and substantially linear movement and a second portion disposed intermediate the first and third portions and adapted to be connected with the fuel control device for varying fuel delivery in response to said linear movement of either end portion, said first portion adapted to be moved linearly and pivoted about the third portion in response to throttle pedal movement; and

actuator means operative during shifting modes of the transmission for linearly moving the third portion without changing the position of the throttle pedal and independent of the throttle pedal position.

4,531,431

METHOD AND DEVICE FOR CONTROLLING A MOTOR VEHICLE POWER UNIT

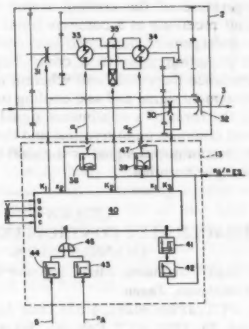
Gunther Dreher, and Gerald Lexen, both of Munich, Fed. Rep. of Germany, assignors to M.A.N.-Maschinenfabrik Augsburg Nurnberg, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,193

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151351

Int. Cl.³ B60K *41/12, 41/18*

U.S. Cl. 74—866 **10 Claims**



1. In a method for controlling a motor vehicle power unit including an internal combustion engine, a variable-ratio transmission, and actuating elements to manipulate the transmission ratio and the fuel supply to the internal combustions engine, the improvement comprising:

using operating control means to directly affect, one, an engine function generator for the fuel supply and in which engine functions are stored, and two, a speed function generator in which the optimum engine speed is stored;

generating a first reference signal from the speed function generator;

sensing the speed at the transmission output by means of a single sensor;

generating a second reference signal indicative of said transmission output speed;

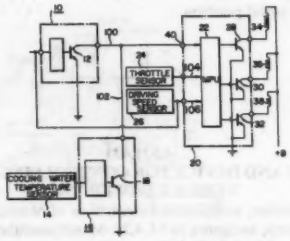
electronically dividing the first reference signal by the second reference signal in an electronic transmission control unit to form a reference signal of the transmission ratio; and

motivating the actuating elements so that the torque of the internal—combustion engine is electronically controlled in response to the fuel infeed and the engine speed is electronically controlled in response to the transmission ratio of the transmission.

4,531,432
AUTOMATIC TRANSMISSION CONTROL DEVICE FOR AUTOMOBILE

Takafumi Inagaki, and Masahiro Ueda, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 7, 1983, Ser. No. 501,782
Claims priority, application Japan, Aug. 21, 1982, 57-144925
Int. Cl.³ B60K *21/00*
U.S. Cl. 74—866 **7 Claims**



1. An automatic transmission control device for an automobile comprising:

a fixed speed driving apparatus outputting a deviation enlargement signal when the acutal speed becomes less than a set fixed speed of the automobile;

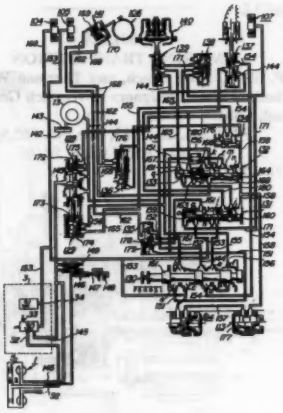
a cooling water temperature detector outputting a cooling water temperature detection signal in accordance with the temperature of the cooling water; and a shift control circuit receiving at a common input terminal said deviation enlargement signal and said cooling water temperature detection signal and controlling a transmission in accordance therewith, and wherein one of said deviation enlargement signal and said cooling water detection signal is in the form of a continuous signal at the shift control circuit common input terminal and the other is in the form of a discontinuous signal at the shift control circuit common input terminal.

4,531,433
HYDRAULICALLY CONTROLLED AUTOMATIC TRANSMISSION

Masaaki Suga, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

PCT No. PCT/JP80/00292, § 371 Date Jul. 28, 1981, § 102(e) Date Jul. 28, 1981, PCT Pub. No. WO81/01597, PCT Pub. Date Jun. 11, 1981
Continuation of Ser. No. 287,717, filed as PCT JP 80/00292 Nov. 29, 1980, published as WO81/01597 Jun. 11, 1981, § 102(e) date, Jul. 28, 1981, abandoned. This PCT application Nov. 29, 1980, Ser. No. 583,298
Claims priority, application Japan, Nov. 29, 1979, 54-153545; Mar. 12, 1980, 55-30227
Int. Cl.³ B60K *41/16, 41/18*
U.S. Cl. 74—869 **4 Claims**

1. An automatic transmission including at least one shift valve having a spool which is applied with hydraulic pressure representing the vehicle speed and, in opposition thereto, with hydraulic pressure representing the engine load, said shift valve being operated according to a predetermined relation between the vehicle speed and the engine load to selectively supply hydraulic pressure to a plurality of friction elements to engage and disengage said friction elements selectively, said shift valve having a snap action starting position between the two end positions of the spool, in which snap action starting position and the pressure receiving area of the spool changes abruptly and the spool starts displacement into one of said end positions, said transmission further including shift valve operation detecting switch means which is directly responsive to the displacement of said spool into one of said end positions, to detect said displacement and produce an electric output signal representing the operation of the shift valve, said detecting switch means including a movable contact element formed by or operated by said valve spool, and a fixed contact element opposed to the movable contact element and mounted on one end wall of said shift valve, said movable contact element being engageable or disengageable with or from said fixed contact element, said fixed contact element including a resilient element which is mounted at one end thereof on said end wall

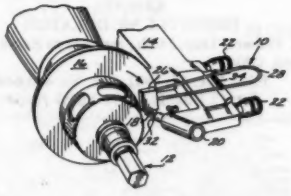


of the shift valve, said movable contact element being kept engaged or disengaged with or from the fixed contact element before said valve spool reaches said snap action starting position, and being kept disengaged or engaged from or with the fixed contact element after said valve spool displaces beyond said snap action starting position.

4,531,434
VIBRATION ATTENUATOR FOR DISC BRAKE ROTOR MACHINING

Andrew R. Vasquez, 4011 E. First St. #1, Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 467,467, May 16, 1983, abandoned. This application Apr. 2, 1984, Ser. No. 596,151
Int. Cl.³ B23B *5/02*
U.S. Cl. 82—34 R **4 Claims**



1. A vibration attenuator for use with a brake lathe having a rotatable disc brake rotor and a tool holder mounting a pair of cutter bits for movement in a predetermined direction to machine opposite faces of the rotor to thereby render the opposite faces planar, said vibration attenuator comprising:

a U-shaped handle having a bend at its mid-portion from which extends a pair of legs;

a pair of pads secured to the face of the free ends of said legs for frictional engagement with the opposite faces of said rotor in superjacent relation to said cutter bits, said pads each being formed with a pin for engagement with said cutter bits upon movement of said cutter bits in said predetermined direction whereby said attenuator may be

moved in said predetermined direction by said cutter bits, but with said attenuator being movable independently of the movement of said cutter bits, said pads being selectively pivotable upon said legs to pivot worn faces of said pads out of engagement with said rotor and present the opposite faces of said pads for engagement with said rotor;

a tension spring interposed between the legs of said handle to bias the pads against the opposite faces of said rotor, with said spring being movable relative to said legs to vary the biasing force exerted by said spring; and

means on said handle which engage the ends of said spring that provide sufficient frictional restraint to prevent inadvertent displacement of said spring from a selected position.

4,531,435

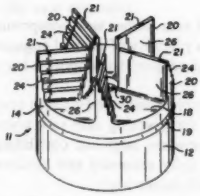
VENEER LATHE CHUCK

Donald C. Walser, Surrey, Canada, assignor to Forintek Canada Corp., Canada

Filed Sep. 29, 1982, Ser. No. 428,477

Int. Cl.³ B23B *33/00*; B27L *5/00*

U.S. Cl. 82—40 R **16 Claims**



1. A chuck head comprising a substantially circular base rotatable about an axis of rotation and extending in a radial direction, perpendicular to the axis of rotation and including a generally wedge-shaped, substantially straight lug having a plurality of transversely extending corrugations of stepped configuration on substantially an entire first face thereof, the lug extending axially forwardly from a forward end of the chuck head, the lug extending radially of the head and having a plurality of corrugations extending axially of the head on a second face thereof.

4,531,436

SLICING MACHINE HAVING INTERRUPT MEANS

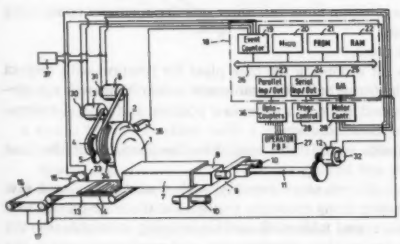
Peter Antonissen, Norfolk, England, assignor to Thurne Engineering Company Limited, Norwich, England

Filed May 29, 1984, Ser. No. 614,428

Claims priority, application United Kingdom, May 27, 1983, 8314768

Int. Cl.³ B26D *7/28*

U.S. Cl. 83—68 **9 Claims**



1. A slicing machine including a rotating blade, feed means to feed a product to be sliced towards said blade, monitoring means for monitoring said blade and outputting a signal when said blade is in a predetermined position, counting means for establishing when said blade is cutting the last slice in a group of slices and outputting a signal indicating this condition, a manually operated interrupt switch, and interrupt means to interrupt operation of said feed means, said interrupt means being enabled by operation of said monitoring means said counting means and said interrupt switch simultaneously, whereby after manual actuation of said interrupt switch said operation of said feed means is disabled only at a time so that a complete group of slices is formed.

4,531,437

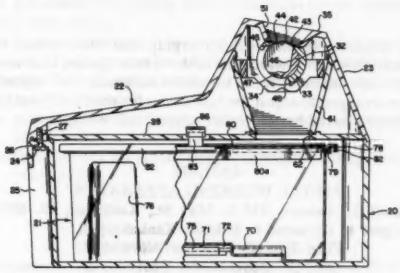
ROTARY NEEDLE AND SYRINGE DESTRUCTOR

Michael J. Szablak, Stephens City, and Glen E. Tomblin, Winchester, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Oct. 24, 1983, Ser. No. 544,622

Int. Cl.³ B26D *1/00*

U.S. Cl. 83—165 **11 Claims**



1. A needle and syringe destructor comprising a base housing and an upper closure body therefor, rotary die means mounted in said closure body for severing needles and syringes, a receptacle slidable into and out of said base housing, guide means in said closure body for directing the severed parts into said receptacle, a cover for said receptacle, and means for automatically closing said cover as said receptacle is withdrawn from said base housing.

4,531,438

ANTIKICKBACK HOLD-DOWN SAFETY DEVICE FOR TABLE SAWS

Louis C. Pair, Kingston, Tenn., assignor to Joe H. Walker, Harriman, Tenn.

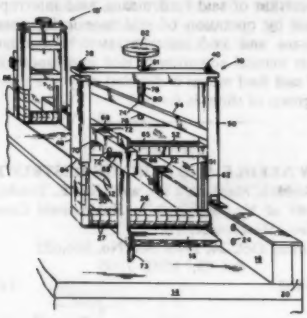
Filed May 4, 1984, Ser. No. 607,145

Int. Cl.³ B26D *7/06*; B27B *25/06*

U.S. Cl. 83—156 **3 Claims**

1. In an antikickback safety apparatus for use with a table-mounted saw having a horizontal table for supporting a workpiece and a blade rotatable in a longitudinal plane and disposed in a working relationship with said table; the improvement comprising a pair of detachable vertically oriented workpiece hold-down assemblies of a generally rectangular configuration disposed above said table and perpendicular to the workpiece at longitudinally spaced apart locations to said blade and oriented perpendicular to said plane, each assembly comprising: a pair of spaced apart fixed vertical elongated members, said top horizontal cross member having two ends; a pair of threaded shafts having two ends disposed within said fixed vertical elongated members, said shafts being threadedly attached at the first ends thereof to the ends of said top horizontal cross member, said shafts being threadedly attached at the second ends thereof to each of said vertically displaceable members; a central cross member between said fixed vertical elongated members; a cylindrical resilient roller means having a raised

spiral surface thereon and being affixed at each end thereof to one of the vertically displaceable members and adapted to be positioned over said workpiece in a contacting relationship therewith; bias means operatively associated with the verti-



cally displaceable members for urging said roller means in a vertical direction towards the table to bear against said workpiece with sufficient force to inhibit kickback, and adjusting means arranged to adjust the bias means for selectively varying the force exerted by said roller against said workpiece.

4,531,439

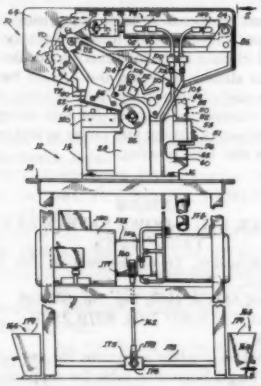
METAL WORKING APPARATUS

Raymond L. Valente, 535 S. May St., Kankakee, Ill. 60901, assignor to Raymond L. Valente, Kankakee, Ill.

Filed Jun. 16, 1983, Ser. No. 504,882

Int. Cl.³ B23D *17/06*; B26D *11/00*

U.S. Cl. 83—200 **14 Claims**



1. A metal working apparatus comprising: a fixed frame; first and second metal working tools; mounting means including a movable frame member and means for pivotally mounting said movable frame member to said fixed frame for operatively mounting said first and second tools to said fixed frame; said mounting means being pivotally movable alternatively in one of a first direction for operating said first tool and a second direction for operating said second tool; bi-directional drive means carried upon said fixed frame above said pivotal mounting means for driving said mounting means in said first and second directions; and operator accessible control means for respectively controlling the direction of operation of said drive means so as to drive the mounting means respectively in said first and second directions; wherein said drive means comprises dual acting piston means and rack and pinion means operatively coupling said piston means for pivoting said movable frame member bi-directionally with respect to said fixed frame.

4,531,440

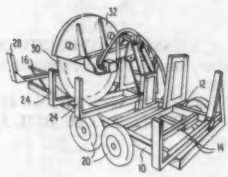
RADIAL ARM TIMBER SAW AND POWER CONTROLLER THEREFOR

Bobby D. Lucky, Athens, Ala., assignor to Lucky Manufacturing Co., Huntsville, Ala.

Filed Mar. 23, 1982, Ser. No. 360,823

Int. Cl.³ B27B *7/02*

U.S. Cl. 83—471.2 **10 Claims**



1. A mobile radial arm timber saw comprising:

a trailer bed with a plurality of ground engaging wheels, said trailer bed being adapted to support a log thereon;

a saw boom;

a pivot arm pivotably connected to said trailer bed and to said saw boom for pivoting said saw boom from a fully retracted saw position adjacent one lateral side of said trailer bed to a fully extended saw position adjacent the other side of said trailer bed;

means carried by said trailer bed for limiting the lateral movement of a log away from the fully retracted saw boom side of said trailer bed when supported by said trailer bed; and

means pivotably connected to said trailer bed and to said saw boom for selectively applying power to said saw boom at an angle to the longitudinal axis of said pivot arm, said angle being not less than about ten degrees at any point in the movement of said saw boom from the fully retracted saw position to the fully extended saw positon.

4,531,441

COMBINATION TABLE AND MITER SAW

Otto Bergler, Muhlacker-Lomersheim, Fed. Rep. of Germany, assignor to Eugen Lutz GmbH & Co. Maschinenfabrik, Fed. Rep. of Germany

Continuation of Ser. No. 347,245, Feb. 9, 1982,. This application Jun. 14, 1984, Ser. No. 621,125

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106098

Int. Cl.³ B27B *5/00*; B27G *5/02*

U.S. Cl. 83—471.3 **9 Claims**

1. Combination table and miter saw arrangement comprising

a frame,

a base plate,

means for mounting the base plate for rotation with respect to the frame between a table saw position through a predetermined angle to a miter saw position and having a circular aperture therein,

a rotatable round table seated in the aperture of the base plate and having a slot,

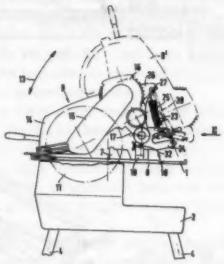
a motor driven saw assembly with a saw blade, said saw assembly being pivotally mounted at the edge on one side of the round table with said blade being insertable into the slot for making mitering cuts and positioned within the slot for table sawing,

means mounting the saw assembly for pivotal movement about a first pivot axis for making mitering and cross cuts,

a block means included in the pivotal mounting of the saw assembly and being fixed to the round table,

said block means comprising

means for rotating the saw assembly about a second axis perpendicular with respect to said first axis,



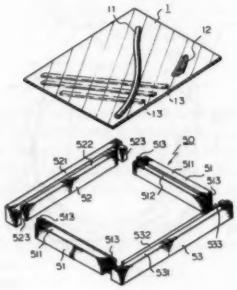
a threaded spindle interconnected between the saw assembly and the block means to serve as an adjustable locking device for the saw assembly.

4,531,442

SOUND BOARD ASSEMBLY FOR AN UPRIGHT PIANO

Yasutoshi Kaneko, and Hideo Yamashita, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 28, 1984, Ser. No. 594,352
Int. Cl.³ G10C 3/06
U.S. Cl. 84—195 **5 Claims**



1. An improved sound board assembly for an upright piano comprising

a sound board provided with a plurality of elongated ribs which are attached to the rear side surface of said sound board, and

a sound board support which is attached to the rear side surface of said sound board and made up of four side bars connected at longitudinal ends thereof to each other to form a rectangular frame having four corner junctions,

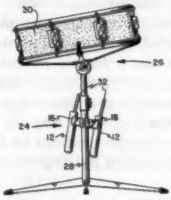
each said side bar being made up of an outer bank and a inner bank having an upper surface which is lower than an upper surface of said outer bank.

4,531,443

PERCUSSION STICK HOLDER

Richard P. Gillis, Jr., 332 Kingswood, El Paso, Tex. 79932

Filed Oct. 9, 1984, Ser. No. 659,178
Int. Cl.³ G10G 7/00
U.S. Cl. 84—329 **3 Claims**



1. Apparatus for holding percussion sticks on an instrument stand, comprising:

at least two tubes each having a first open end for accepting one of said percussion sticks and a second closed end;

means for holding said at least two tubes in parallel spaced apart relationship;

a gripper effective to removingly engage said instrument stand; and

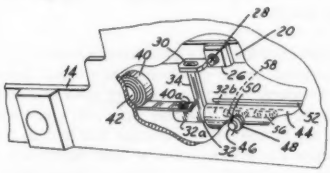
fastener means for rotationally securing said gripper to said plate means.

4,531,444

WEAPON CHARGER

Theodore A. Jackson, Utica, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 7, 1983, Ser. No. 539,783
Int. Cl.³ F41D 5/02
U.S. Cl. 89—1.4 **8 Claims**



2. In a turret having a weapon with a sear means, a charger apparatus for activating the sear means comprising a slidable charger slide means for activating the sear means, chain means connected to said charger slide means, rotatable coiled flat return spring means connected to said charger slide means and disposed forwardly thereof to bias said charger slide means away from the sear means, gear means meshing with the chain means to pull the charger slide means rearwardly for activating the sear means with said return spring means rotatably uncoiling when the gear means is rotated in one direction and said gear means rotatable in the other direction to permit said return spring means to pull the charger slide means forwardly by virtue of the return spring means rotatably coiling.

4,531,445

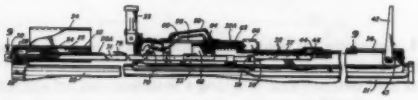
PROJECTILE LAUNCHER

Michael A. Nee, San Dimas, Calif., assignor to N.I. Industries, Inc., Los Angeles, Calif.

Filed Nov. 7, 1983, Ser. No. 548,977
Int. Cl.³ F41F 3/04
U.S. Cl. 89—1.813 **2 Claims**

1. A projectile launcher including breech and muzzle sec-

tions telescopingly connected to enable the launcher to have shortened inoperative and extended operative states, a housing on the muzzle section, firing mechanism including a firing member and a firing spring, said firing member movable between a forward cocked position in which the firing spring is tensioned and a rearward firing position, said firing member extended freely into said housing and provided with a transverse shoulder, said housing having a boot covered port adjacent the rear end thereof, a trigger pivotally mounted in said housing and including a forward portion under said port and a rear portion, a sear rotatably mounted in said housing and having first and second arcuately spaced shoulders, a spring within said housing urging said trigger into a first position in which the forward portion may be depressed by pressure applied thereto through the boot by fingers of one hand and the rear trigger portion holding the second shoulder against



sear rotation in one direction until said forward portion is depressed, a spring within said housing and connected to the sear to effect rotation thereof in a direction such that the second shoulder is yieldably held in engagement with the rear portion of the trigger, the first shoulder then held in a position to be engaged by the transverse shoulder of the firing member, when the launcher is so extended that but short further extension is required to establish said operative state and said forward cocked position of said firing member, at the end of said short further extension, said tensioned firing spring then exerting substantial force against said first sear shoulder, said shoulders so dimensioned that the end of the trigger in engagement with the second shoulder is at a radial distance from the axis of the sear which is greater than the radial distance between the shoulder of the firing member when in engagement with the first sear shoulder.

4,531,446
MACHINE GUN ADAPTOR
Steven C. VanVoorhees, 531 S. Ridgewood Ave., Daytona, Fla. 32014
Filed Jul. 26, 1982, Ser. No. 401,844
Int. Cl.³ F41C *21/10*
U.S. Cl. 89—7.9 **13 Claims**

1. An apparatus for converting a high caliber machine pistol of the type having a frame, a receiver mounted on the frame, a barrel mounted on the receiver and a sear movable in response to a weapon trigger, to a low caliber machine pistol comprising:

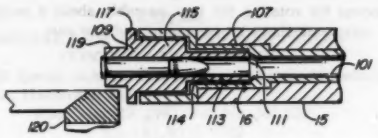
a conversion frame disposed on said receiver said conversion frame having a rider portion extending longitudinally at one side thereof and having a downwardly disposed arm portion;

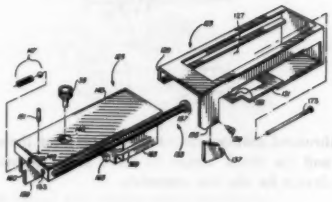
a bolt carrier slideably disposed on the rider portion of said conversion frame;

a bolt mounted on said bolt carrier;

recoil spring means disposed in said conversion frame for biasing said bolt carrier in a forward position;

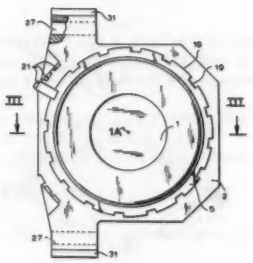
a sear foot attached to the bolt carrier said sear foot including an indentation adapted to engage the sear of the machine pistol; and





floating chamber means coupled to the barrel for augmenting recoil force on the bolt when the weapon is fired.

4,531,447
BARREL MOUNT FOR CANNON
Wolfgang Bartels, Kaarst, Fed. Rep. of Germany, assignor to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany
Filed Nov. 19, 1982, Ser. No. 443,070
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146165
Int. Cl.³ F41F *21/06*
U.S. Cl. 89—37.7 **1 Claim**



1. A cannon comprising:

a barrel extending along a barrel axis and having a cradle provided with a pair of trunnions centered on and defining a trunnion axis which is substantially perpendicular to the barrel axis;

a carriage having a pair of cheeks spaced apart along the trunnion axis and juxtaposed with the trunnions;

respective gudgeons secured to the cheeks centered on the trunnion axes and surrounding the trunnions;

respective axial bearings braced axially between the trunnions and gudgeons and centered on the trunnion axis;

respective radial bearings supporting the trunnions in the gudgeons for swiveling of the barrel about the trunnion axis in the carriage;

respective rings centered on the trunnion axis and threaded on the gudgeons, the rings being oppositely axially braced against the cheeks for axially loading the axial bearings;

said cheeks have cheek faces perpendicular to the trunnion axis and the rings have ring faces perpendicular to the trunnion axis and confronting and engaging the respective cheek faces in surface contact;

said gudgeons have outer ends spaced sufficiently from the respective cheeks so that the barrel axis can be positioned substantially offcenter in the carriage;

further comprising means including respective radially releasable latches engageable between the rings and the respective gudgeons for preventing rotation of the rings on the gudgeons;

said rings are each formed with a plurality of outwardly open cutouts equi-angularly spaced relative to the trunnion axis, the latches being selectively radially engageable with the cutouts and with said respective gudgeons; and

wherein the gudgeon has recesses angularly spaced about the trunnion axis and engageable also by the latches.

4,531,448

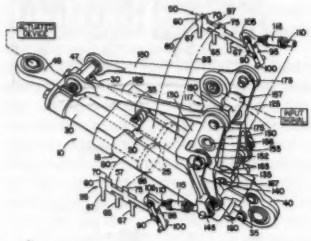
BALANCED OUTPUT HYDRAULIC ACTUATOR SYSTEM

Philip E. Barnes, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 14, 1984, Ser. No. 609,915

Int. Cl.³ F15B 9/10

U.S. Cl. 91—384 **5 Claims**



1. In an hydraulic actuator system comprising a pair of parallel hydraulic actuators, each actuator comprising a cylinder rigidly connected to the cylinder of the other actuator and an output member reciprocally displaceable with respect to the cylinder and rigidly connected to the output member of the other actuator;

said actuator system further comprising a pair of control valves, each controlling the pressurization of an associated actuator;

an idler linkage;

an input linkage connected to said control valves and to said idler linkage for movement thereon, said input linkage being adapted for simultaneously applying an input signal to each of said control valves; and

a feedback linkage connected to said output members and to said idler linkage for applying a feedback signal to said control valves by means of said idler and input linkages in response to movement of said output members; said hydraulic actuator system being characterized by:

said idler linkage comprising first and second independently movable, discrete idler levers pivotally grounded to said first and second actuators, respectively;

said feedback linkage comprising first and second laterally spaced, discrete feedback levers pivotally connected to both said first and second idler levers, respectively, and to said output members;

whereby imbalanced operation of said actuator system resulting in longitudinal displacement of said connected output members effects independent longitudinal displacement of said feedback levers relative to one another for independent, redundant application of said feedback signals to said control valves with enhanced accuracy and predictability and reduced linkage stress.

4,531,449

ARRANGEMENT FOR CONTROLLING A HYDRAULIC MOTOR

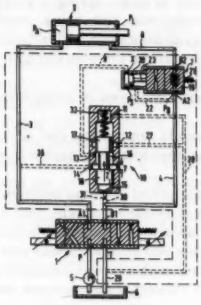
Werner Reith, Karlstadt, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,572

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140266

Int. Cl.³ F15B 13/042

U.S. Cl. 91—420 **7 Claims**



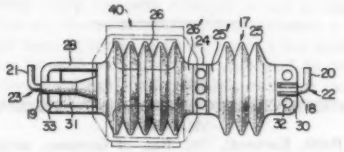
1. An arrangement for controlling a hydraulic motor having interchangeable supply and discharge sides, comprising a throttling direction valve having in a working position thereof a supply side and a discharge side and an inlet port and an outlet port at each of said sides; said outlet port of the supply side of said directional valve being connected to a supply side of the hydraulic motor; a speed lowering brake valve controlling the discharge side of the hydraulic motor and having a control piston with a control side and a port connected with the inlet port of the discharge side of said directional valve; a control valve arrangement connected between said control side of said control piston and the supply side of the hydraulic motor and having end sides with end side ports, said control valve having a control slider which selectively connects said control side of said control piston with the supply side of the hydraulic motor and disconnects said control side of said control piston from the latter, one of said end side ports being constantly connected with said port of the speed lowering brake valve for controlling the discharge side of the hydraulic motor prior to said directional valve and the other end side port being constantly connected with the outlet port of the discharge side of said directional control valve for controlling the connection of said control side of said control piston of the speed lowering brake valve with the discharge side of said hydraulic motor, said control valve also having a control spring acting upon said control slider in a direction corresponding to a direction in which a pressure medium acts upon the discharge side of the hydraulic motor after said directional valve.

4,531,450

MULTI-STAGE ACTUATOR

Tosimichi Yamada, Fuji, and Hideo Yoshida, Fujinomiya, both of Japan, assignors to Nihon Plast Co., Ltd., Shizuoka, Japan

Filed Oct. 19, 1983, Ser. No. 543,585
Claims priority, application Japan, Oct. 21, 1982, 57-185239
Int. Cl.³ F16J 3/04
U.S. Cl. 92—37 7 Claims



1. A multi-stage actuator comprising:

a pair of bellows each including a hollow accordion-type convolution section having ends closed by integral end sections and a vacuum port means pneumatically connecting the bellows to a vacuum source, the convolution section of each bellows having a plurality of axially arranged convolutions and being axially collapsible to shorten the axial dimension of the bellows when vacuum is introduced into the bellows through said vacuum port means;

said bellows being arranged in substantially axially aligned relationship;

means mechanically connecting one of the end sections of one of said bellows to an adjacent end section of the other bellows;

the other end section of said one bellows being designed to be fixed to a stationary machine part so that, when said convolution section of said one bellows is axially collapsed, said one end section of said one bellows is axially moved together with said mechanically connecting means and with the other bellows toward said stationary machine part;

the other end section of the other bellows being designed to be mechanically connected to a movable machine part; and

means extending axially over the convolution section of the other bellows to prevent said convolution section of the other bellows from being axially stretched when said one bellows is axially collapsed and to transmit to said movable machine part the movement of said one end section of said one bellows toward said stationary machine part, said axially extending means and the other bellows being arranged such that the convolution section of the other bellows is axially collapsible relative to said axially extending means to move the other end section of the other bellows relative to said axially extending means toward said stationary machine part,

wherein the other end section of the other bellows comprises an axially elongated protrusion axially extending from the adjacent end of the convolution section of the other bellows, and

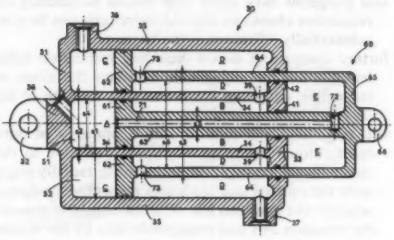
wherein said axially extending means comprises an axially extending link member including means fixing one end of said link member relative to said mechanically connecting means and means on the other end of said link member forming a guide operatively associated with said axially elongated protrusion, said guide being so shaped as to slidaby accomodate said axially elongated protrusion to allow the same to be moved relative to said guide toward said one bellows and act as a stop for preventing movement of the adjacent end of the convolution section of the other bellows relative to said link member toward said movable machine part when the one bellows is axially collapsed.

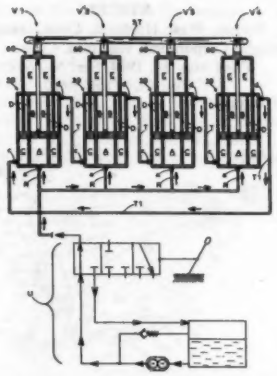
4,531,451

MULTIPLE CHAMBER COAXIAL HYDRAULIC JACK AND CONTROL SYSTEM THEREFOR

Pierre C. Mouton, Grigny, France, assignor to Société Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." , Paris, France

Filed Sep. 27, 1983, Ser. No. 536,433
Claims priority, application France, Sep. 28, 1982, 82 16263
Int. Cl.³ F15B 11/22
U.S. Cl. 92—108 4 Claims





1. A multiple chamber, coaxial hydraulic jack comprising:

(a) a hollow cylindrical body defining an interior, the body having an annular median wall extending along the length of the interior to divide the interior into a cylindrical center cavity and an annular peripheral cavity, the annular median wall defining an orifice near a first end of the cylindrical body to permit communication between the respective cavities;

(b) a center piston defining an opening therethrough slidably retained within the center cavity and dividing the center cavity into first and second chambers;

(c) an annular piston slidably retained within the annular peripheral cavity and dividing the annular peripheral cavity into third and fourth chambers, the second and fourth chambers being located on the same sides of the center and annular pistons such that the orifice through the annular median wall allows communication therebetween, the area of the side of the annular piston facing the third chamber being equal to the sum of the effective areas of the sides of the annular piston and the central piston facing the fourth and second chambers, respectively;

(d) an annular piston rod portion attached to the annular piston, and extending through the fourth chamber and the first end of the cylindrical body;

(e) a central piston rod portion attached to the central piston,

and extending through the second chamber and the first end of the cylindrical body, the distal ends of the annular piston rod portion and the central piston rod portion being joined by a rod end wall so as to form a fifth chamber between the rod end wall and the first end of the cylindrical body, the central piston rod portion defining an axial channel to allow fluid communication between the first and fifth chambers;

(f) at least one orifice defined by the annular rod portion adjacent the annular piston; and,

(g) means to introduce hydraulic fluid into the first, third and fourth chambers.

3. A system for the synchronized movement of a plurality of hydraulic jacks comprising:

(a) a plurality of hydraulic jacks, each jack comprising:

(i) a hollow cylindrical body defining an interior, the body having an annular median wall extending along the length of the interior to divide the interior into a cylindrical center cavity and an annular peripheral cavity, the annular median wall defining an orifice near a first end of the cylindrical body to permit communication between the respective cavities;

(ii) a center piston defining an opening therethrough slidably retained within the center cavity and dividing the center cavity into first and second chambers;

(iii) an annular piston slidably retained within the annular peripheral cavity and dividing the annular peripheral cavity into third and fourth chambers, the second and fourth chambers being located on the same sides of the center and annular pistons such that the orifice through the annular median wall allows communication therebetween, the area of the side of the annular piston facing the third chamber being equal to the sum of the effective areas of the sides of the annular piston and the central piston facing the fourth and second chambers, respectively;

(iv) an annular piston rod portion attached to the annular piston, and extending through the fourth chamber and the first end of the cylindrical body;

(v) a central piston rod portion attached to the central piston, and extending through the second chamber and the first end of the cylindrical body, the distal ends of the annular piston rod portion and the central piston rod portion being joined by a rod end wall so as to form a fifth chamber between the rod end wall and the first end of the cylindrical body, the central piston rod portion defining an axial channel to allow fluid communication between the first and fifth chambers; and

(vi) at least one orifice defined by the annular rod portion adjacent the annular piston;

(b) a source of pressurized hydraulic fluid;

(c) first conduit means to supply pressurized hydraulic fluid to the first chambers of each jack; and

(d) second conduit means connecting the fourth chamber of one jack with the third chamber of the adjacent jack.

4,531,452

LOCK FOR TRANSMITTER CYLINDER OF HYDRAULIC SYSTEM

Norbert Spielmann, Ebern, and Hermann Bauer, Lülsfeld, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,553

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246349

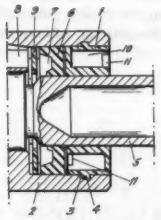
Int. Cl.³ F16J *15/18, 10/02*

U.S. Cl. 92—168 **10 Claims**

1. A transmitter cylinder for the hydraulic brake system of a vehicle, or the like, the transmitter cylinder comprising a cylinder with a bore in it; the cylinder having a first axial side; a piston movable into and out of the cylinder bore from the first side;

a separate lock part installed in the cylinder bore toward the first side of the bore, the lock part having a peripheral wall which contacts the surrounding cylinder bore;

and removal prevention means at the lock part for preventing removal of the lock part from the cylinder bore once the lock part is installed in the cylinder bore; the removal prevention means comprises lock means extending from the peripheral wall of the lock part on the cylinder bore to the inside of the cylinder bore; the lock means being connectable to the cylinder bore by a snap connection; the lock means being breakable for releasing the lock part to be removed from the cylinder bore;



a sealing sleeve around the piston in the cylinder bore; the sealing sleeve being disposed inside the cylinder bore beyond the installed lock part; the sealing sleeve being shaped to be shiftable along the cylinder bore; the lock part being abuttable with the sealing sleeve upon installation of the lock part in the cylinder bore, and the lock part serving as a stop for the sealing sleeve for preventing movement of the sealing sleeve out of the bore; and

the cylinder bore being shaped to define an afterrun space therein around the piston, and that after-run space being further in the cylinder than the sealing sleeve; the lock part and the sealing sleeve serve as a limit for the after-run space.

4,531,453

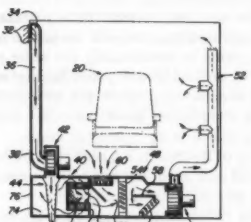
ATMOSPHERE CONTROL ARRANGEMENT FOR AN OPERATOR ENCLOSURE

Bruce L. Warman, Silvis, Ill.; Carl W. Dailey, Bettendorf, Iowa, and Floyd D. Johnson, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed May 16, 1983, Ser. No. 495,320

Int. Cl.³ B60H *3/06*

U.S. Cl. 98—2.11 **11 Claims**



3. An atmosphere control system for the operator enclosure of a self-propelled off-the-road vehicle carried within said enclosure, said enclosure having walls and a floor, comprising:

a plurality of components including;

fresh air inlet means associated with a wall of the enclosure;

a pressurizing blower for drawing air through the inlet means;

a precleaner for receiving air delivered by the pressurizing

blower and passing a first portion of that air for delivery inside the enclosure and directing a second portion of the air substantially directly from the precleaner externally of the enclosure;

a fresh air filter for receiving and filtering the first portion of air and passing it downstream;

a heat exchanger for receiving the filtered first portion of air and passing it downstream; and

a circulating blower for receiving and circulating within the enclosure air passed downstream by the fresh air filter;

wherein said components, with respect to the flow of the first portion of air and the circulating air, are arranged in series so that all air entering the system passes downstream and through all components downstream of its point of entry.

4,531,454

AIR CONDITIONING SYSTEM

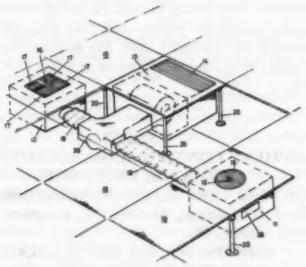
Hendrik J. Spoormaker, 158 Dorado St., Waterkloof Ridge, Pretoria, Transvaal, South Africa

Filed Aug. 14, 1984, Ser. No. 640,657

Claims priority, application South Africa, Aug. 29, 1983, 83/6390

Int. Cl.³ G03F 7/24

U.S. Cl. 98—38 F **2 Claims**



1. An air conditioning system for a building with a plurality of floor tiles covering an underfloor plenum, comprising:

an air conditioning unit with an intake and an outlet, the intake being in substantially the same plane as the floor tiles, the air conditioning unit having an operating mode and a nonoperating mode, the air conditioning unit producing conditioned air at the outlet when the air conditioning unit is in the operating mode;

a plurality of flexible ducts, each duct having a first end and a second end, each first end being connected to the outlet of the air conditioning unit; and

a plurality of fan air terminals, each fan air terminal including an inlet, an outlet, and an aperture, the inlet of a fan air terminal being connected to the second end of a flexible duct, the outlet of a fan air terminal being in substantially the same plane as the floor tiles, each fan air terminal having an on mode and an off mode, each aperture being sized to discharge conditioned air into the plenum when the air conditioning unit is in the operating mode and the associated fan air terminal is in the off mode and to draw air from the plenum when the air conditioning unit is in the nonoperating mode and the associated fan air terminal is in the on mode.

4,531,455

VENTILATORS

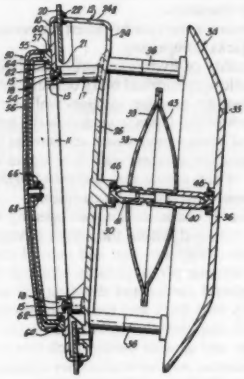
George J. Palmer, Ilford, England, assignor to Turbo Ventana Limited, London, England

Filed Jan. 9, 1984, Ser. No. 569,243

Claims priority, application United Kingdom, Jan. 26, 1983, 8302108

Int. Cl.³ E06B 7/02

U.S. Cl. 98—96 **8 Claims**



1. A ventilator unit having an inner plate member, an outer plate member and an intermediate member, means mounting the outer member spaced from the inner plate member along a central axis of the ventilator unit, and means mounting the intermediate member at a location between the inner and outer members, the inner plate member having a central aperture therethrough concentric with said central axis of the ventilator, an annular surface around said central aperture and concentric therewith, which annular surface faces towards said outer plate member and is concavely curved, said outer plate member being in the form of a dished plate having a concave surface facing towards said inner plate member and a convex surface facing away from said inner plate member, said intermediate member being lens-shaped having an outer convex surface facing said concave surface of the outer plate member and an inner convex surface facing the concave surface of the inner plate member, the lens-shaped member having its axis of rotational symmetry coinciding with said central axis of the ventilator unit, said inner plate member having engagement portions with surfaces for engagement with a wall or the like surface adjacently surrounding an opening therethrough, said surfaces being spaced from said concave annular surface of the inner plate member in the opposite direction from that in which the intermediate member is spaced from said inner plate member, said engagement surfaces facing away from the outer plate member and intermediate plate member, said engagement surfaces lying in a common plane.

4,531,456

LIQUID DISTRIBUTION TROUGH

David M. Kemp, Jr., Naperville, and Hartl R. Jones, Bensenville, both of Ill., assignors to FMC Corporation, Chicago, Ill.

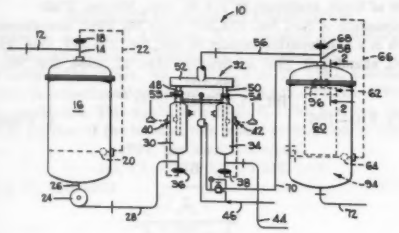
Filed Sep. 26, 1984, Ser. No. 654,448

Int. Cl.³ A23L 2/40

U.S. Cl. 99—323.2 **12 Claims**

1. In a cooling and carbonating vessel having disposed therein a liquid distributing trough momentarily retaining liquid supplied to the vessel and a plurality of cooling surfaces adjacent to and extending downwardly from the trough, the vessel also being supplied with carbon dioxide at a selected pressure; the improvement in said liquid distributing trough

comprising means for establishing at least two liquid retaining chambers; one of said chambers receives liquid directly from a conduit supplying liquid to the vessel and the other receiving excess liquid from said one chamber; means in each of said



chambers for allowing liquid to gravitationally flow over the cooling surfaces and in the course thereof absorb carbon dioxide; and means in said vessel for collecting the cooled and carbonated liquid.

4,531,457

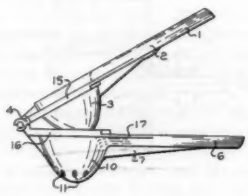
TWO PIECE JUICER

Lillian Sivaslian, 81 Windtree, Torrington, Conn. 06790

Filed Jun. 1, 1984, Ser. No. 616,401

Int. Cl.³ A23N *1/00*; A47J *43/00*

U.S. Cl. 99—507 **4 Claims**



1. A squeezing device comprising

an upper handle, handle end,

a cup shaped portion formed integral with one handle end thereof,

fingers extending from said cup shaped portion,

a notched section in each said finger at its outer extremity,

a lower handle, handle ends,

a lower cup shaped portion formed integral with one handle end thereof,

elements projecting from said lower cup shaped portion,

a pivot pin formed integral with and at right angles to said elements,

said pin being rotatably fitted in the notched portion of the fingers of the upper cup portion whereby either handle is movable toward or away from the other to fit one cup shaped portion into the other when swung on the pin as a pivot.

4,531,458

COMPRESSED GAS POWERED AMMUNITION FOR SMALL ARMS

Michael E. Saxby, Norton Lindsey, England, assignor to Hillvenna Limited, England

Filed Jul. 12, 1983, Ser. No. 513,201

Int. Cl.³ F42B *5/02*

U.S. Cl. 102—440 **7 Claims**

1. A cartridge comprising:

(a) a hollow elongate casing having an intermediate portion between a rear base end portion and a front discharge end portion,

(b) a gas storage space located in the intermediate portion for storing compressed gas,

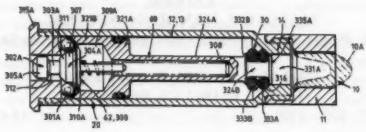
(c) discharge valve means having a valve member normally closing a gas discharge opening between said gas storage space and the front discharge end portion,

(d) a hollow piston reciprocable in said base end portion,

(e) a discharge valve actuating member extending from said piston through said gas storage space and connecting mechanically said valve member with the piston so that the discharge valve means is openable by rearward movement of said piston,

(f) a fixed member in the rear base end portion and confronting said piston, said fixed member having a central aperture coaxial with said piston, and

(g) actuating means comprising a plurality of rigid members in said base end portion and a displacer between said rigid members,



(h) said displacer is disposed coaxially with respect to said piston, extends forwardly into said piston and rearwardly into said central aperture, and has a head section,

(i) said rigid members are supported by said head section in a first position between said piston and fixed member to space said piston from said fixed member and to support said piston against a thrust exerted by the pressure in said gas storage space,

(j) said displacer is drivable axially forwardly to slide the head section from between said rigid members allowing said rigid members to move radially inwardly to a second position in which they are encompassed by the piston, to allow the piston to pass axially rearwardly towards the fixed member in response to said thrust, and

(k) a resetting spring abuts said displacer to exert a forward thrust on said piston for closing said valve means, and a rearward thrust on said displacer to urge the head between the rigid members for moving said rigid members from said second position to said first position.

4,531,459

STANDING POSITION SUPPORT APPARATUS FOR AMUSEMENT VEHICLE

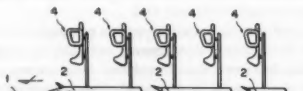
Kazuo Yamada, Tokyo, Japan, assignor to Togo Japan Inc., Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 433,275

Claims priority, application Japan, Oct. 12, 1981, 56-162195; Apr. 22, 1982, 57-67926; Apr. 22, 1982, 57-67927; Apr. 22, 1982, 57-67928

Int. Cl.³ A63G *21/04*

U.S. Cl. 104—53 **14 Claims**



1. A standing position support apparatus for an amusement vehicle, comprising:

(a) a main body of said amusement vehicle, which is free to move along a track;

(b) a standing position support column extending vertically from said main body;

(c) a height-adjusting mechanism movable vertically along said column and which comprises first locking means for locking said height-adjusting mechanism appropriate to the height of a passenger; and

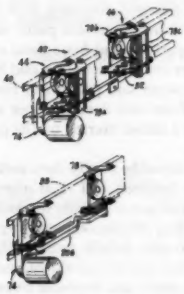
(d) a passenger safety support mechanism for supporting the passenger in a standing posture, comprising a pair of right and left arm-insertion members for holding the passenger from the back at both sides and from over and around the shoulders down to the sides, each of said arm-insertion members vertically pivotally mounted on said height-adjusting mechanism, and second locking means operatively connected to said arm-insertion members for locking said arm-insertion members at a desired closed position.

4,531,460

MATERIAL HANDLING SYSTEM

Karl A. Pamer, Chagrin Falls, Ohio, assignor to Litton Systems, Inc.

Filed Mar. 10, 1982, Ser. No. 356,816
Int. Cl.³ B61B *3/02*; B61C *13/04*
U.S. Cl. 105—150 **16 Claims**



1. Carrier construction for material handling systems in which either a carrier of a first arrangement, or a carrier of a second arrangement, is constructed to move along track means; the carrier construction comprising:

(a) first head means including first support-wheel means;

(b) second head means including second support-wheel means;

(c) first connection means carried by said first head means;

(d) second connection means carried by said second head means;

(e) first interconnection means releasably connectable to said first connection means and said second connection means to interconnect said first head means and said second head means in a first predetermined arrangement wherein said first head means and said second head means are disposed in tandem with their respective support-wheel means longitudinally aligned; and

(f) second interconnection means releasably connectable to said first connection means and said second connection means to interconnect said first head means and said second head means in a second predetermined arrangement wherein said first head means and said second head means are disposed in lateral opposition with their respective support-wheel means axially aligned;

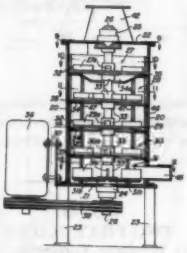
(g) said first head means and said second head means being interconnected either in said first predetermined arrangement by said first interconnection means or in said second predetermined arrangement by said second interconnection means.

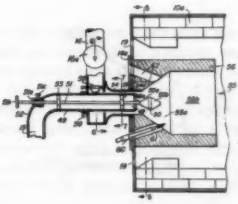
4,531,461

SOLID FUEL PULVERIZING AND BURNING SYSTEM AND METHOD AND PULVERIZER AND BURNER THEREFOR

William H. Sayler, Salt Lake City, and Justin C. White, Magna, both of Utah, assignors to T.A.S., Inc., Magna, Utah

Continuation of Ser. No. 378,347, May 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,267, Dec. 15, 1980, abandoned. This application Mar. 12, 1984, Ser. No. 588,900
Int. Cl.³ F23D *17/00*
U.S. Cl. 110—106 **17 Claims**





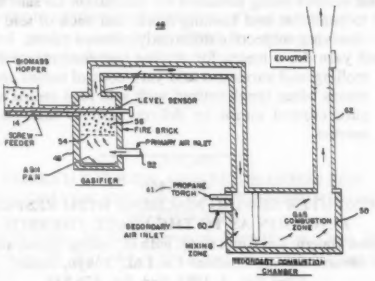
1. A solid fuel pulverizing and burning system characterized by a possible turndown ratio of up to at least fifteen to one and comprising a pulverizer for impacting relatively coarsely sized solid fuel and autogenously pulverizing it in turbulent air, said pulverizer having a housing with means for introducing solid fuel to be pulverized, means for introducing ambient primary air, impeller means, and discharge means for passing a stream of the primary air and autogenously pulverized solid fuel to a burner for firing into the ignition chamber of a furnace or other heating structure; a burner having means defining an ignition chamber, an elongate, firing conduit having one end in communication with said discharge means of the pulverizer and the opposite end in communication with said ignition chamber as a firming orifice; said conduit being adapted to pass said stream from end-to-end thereof and into said ignition chambers through said firing orifice; a valve element movably mounted relative to said firing orifice for adjustment closer thereto or farther therefrom as a primary air and fuel feed control valve, said conduit being relatively long and longitudinally imperforate so as to confine the longitudinally extensive flow of said primary air and fuel stream therethrough; structural means within said conduit and mutually spaced along the length thereof for imparting turbulence to said longitudinally extensive flow of primary air and fuel prior to its discharge from said conduit and its entering said ignition chamber; means for introducing a controlled quantity of secondary air into the turbulent stream after its discharge through said firing orifice; means for igniting the pulverized solid fuel in said ignition chamber; means for observing conditions within said ignition chamber; and means for adjusting the position of said valve element relative to said firing orifice in accord with observed condi-

tions in the ignition chamber to control the quantity of primary air and fuel fired into said ignition chamber and to influence flame propagation and flame shape.

4,531,462
BIOMASS GASIFIER COMBUSTOR

Frederick A. Payne, Clemson, S.C., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Continuation of Ser. No. 350,412, Feb. 19, 1982, abandoned, which is a continuation of Ser. No. 113,339, Jan. 18, 1980, Pat. No. 4,334,484. This application Mar. 5, 1984, Ser. No. 584,302
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.[3] F23B *5/00*; F23K *3/00*
U.S. Cl. 110—210 **5 Claims**



1. An apparatus for producing a clean combustion gas in response to combustion of a biomass mixture disposed therein and for drying an object using said clean combustion gas, which comprises in combination:

a screw feeder means for feeding said biomass mixture into said apparatus, said feeder means being horizontally disposed for feeding said biomass mixture into said apparatus along a horizontal direction and having an augered configuration for forcedly feeding said biomass mixture into said apparatus;

a first combustion chamber means for receiving said biomass mixture from said feeder means and burning said biomass mixture therein thereby producing a first combustion gas, said feeder means extending transversely within said first combustion chamber means for levelling the biomass mixture received therein, said feeder means being horizontally disposed in a plane within said first combustion chamber means, said plane substantially corresponding to the maximum desired level of said biomass mixture in said first combustion chamber means, said feeder means sealing said first combustion chamber means from said atmosphere;

a level sensing means extending into said first combustion chamber means and connected to said feeder means for sensing the level of the biomass mixture in said first combustion chamber and for terminating the feed of said screw feeder means when said biomass mixture reaches a predetermined level;

a second combustion chamber means for receiving said first combustion gas and burning said first combustion gas therein thereby producing a second combustion gas;

means for directing said first combustion gas into said second combustion chamber, said means having a cross-sectional area such that the orifice passage resistance to the air passing from said first combustion chamber to said second combustion chamber is increased permitting sufficient secondary air to be pulled into said second combustion chamber;

a nozzle means for forcedly directing said second combustion gas from said second combustion chamber means onto said object, said second combustion gas drying said object;

pump means communicating with said second combustion chamber means for creating a negative pressure region within said apparatus, said negative pressure region drawing said first combustion gas into said second combustion chamber means and forcedly directing said second combustion gas through said nozzle means and onto said objects; said biomass mixture comprises a highly porous fuel having a low moisture content;

means for producing a primary flow of air into said first combustion chamber means;

primary air inlet port means responsive to said means for producing said primary flow of air into said first combustion chamber means, the primary air flowing from said primary inlet port means through the porous fuel in said first combustion chamber means thereby burning the porous biomass mixture therein;

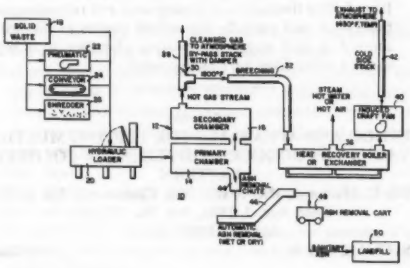
first gas outlet port means for permitting said first combustion gas to exit from said first combustion chamber means to said second combustion chamber means;

whereby the level sensing means stops the feed of said screw feeder means when the biomass mixture in said first combustion chamber has reached a predetermined level, an even biomass distribution being achieved in said first combustion chamber means when the biomass mixture is levelled thereby permitting an even burn of said biomass in said first combustion chamber means.

4,531,463
BAFFLE FOR CONTROLLED AIR INCINERATORS

Richard L. Kratz, Hereford; Darrel R. Kiser, Perkasie, and R. Scott Smith, Lansdale, all of Pa., assignors to American Energy Corporation, Lansdale, Pa.

Filed Oct. 24, 1983, Ser. No. 544,977
Int. Cl.[3] F23B *5/00*; F23C *9/00*
U.S. Cl. 110—212 **16 Claims**



1. A controlled air incinerator comprising:

a primary combustion vessel for receiving combustible materials;

a first means for heating said combustible materials;

a secondary combustion vessel for receiving combustion by-products from said primary vessel, said secondary combustion vessel being cylindrical and having a peripherally opening inlet port and a diametrically opposed peripherally opening outlet port at a first first end thereof;

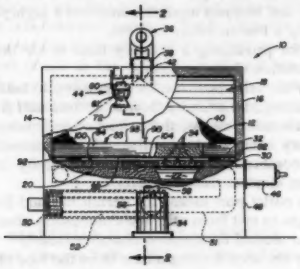
a second means for heating said by-products as said by-products traverse said secondary vessel from said inlet port to said outlet ports; and

a baffle means situated in said secondary vessel adjacent said first end thereof between said inlet port and said outlet port, said baffle means comprising an arch extending parallel to and substantially along the length of the longitudinal axis of said secondary combustion vessel, the apices of said arch being substantially parallel to said longitudinal axis, for increasing the residence time of said by-products in said secondary vessel.

4,531,464
PARTICLE FUEL DIVERSION STRUCTURE

Roger D. Eshleman, Waynesboro, Pa., assignor to Eshland Enterprises, Inc., Greencastle, Pa.

Filed Jul. 20, 1984, Ser. No. 632,998
Int. Cl.[3] F23G 3/00
U.S. Cl. 110—259 6 Claims



1. In a particle fuel burning furnace having an upper particle fuel holding and combustion chamber, a lower combustible gas afterburning chamber and means forming at least one passageway interconnecting a bottom of said upper chamber and a top of said lower chamber, a particle fuel diversion structure comprising:

(a) an elongated fuel diverter block; and

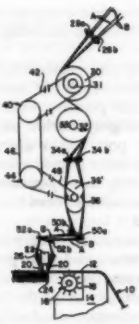
(b) means disposing said diverter block in said upper chamber in spaced relationship above and overlying said passageway;

(c) said diverter block coacting with said bottom of said upper chamber to form a slot which extends laterally away from said passageway while providing communication between said upper chamber and said passageway, said laterally-extending slot preventing particles of fuel from falling through said passageway and relocating combustion of said particle fuel which occurs at the bottom thereof in said upper combustion chamber to a region thereof away from said passageway.

4,531,465
METHOD AND APPARATUS FOR TUFTING MULTIPLE YARNS TO PRODUCE A DIFFERENTLY COLORED PATTERN

Willie E. Hampton, Rte. 5, Box 398, Chatsworth, Ga. 30705

Filed Apr. 2, 1984, Ser. No. 595,614
Int. Cl.[3] D05C 15/32
U.S. Cl. 112—79 A 23 Claims



1. In a machine for producing a tufted fabric, having a variegated color appearance, comprising a machine frame on which is moved longitudinally a continuous primary backing material to receive and retain individual segments of differently colored yarn tufted therein by needles which penetrate said backing material:

feed means on said machine for continuously feeding and separately maintaining at least two separate yarns of different colors thereon for the purpose of tufting said yarns into said backing material to create a varigated appearance,

guide means on said machine for maintaining said separately colored yarns in spaced relation until delivered at a respective needle,

yarn control means for simultaneous operation between said yarns the separation of said differently colored yarns and to control same for variable delivery of separate yarn to a respective needle,

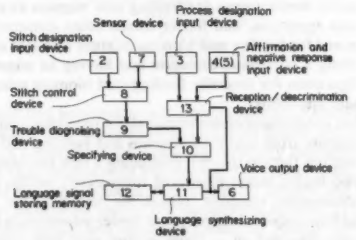
said needles being mounted for oscillation on said machine to penetrate said backing fabric and each of said needles receiving respective differently colored yarns,

and yarn drive means for driving said feed means for controlling said yarns and said yarn control means and drive means being synchronized with said feed means and said yarn control means to deliver yarn to said respective needles.

4,531,466
COMPUTER SEWING MACHINE WITH RESPONSE FUNCTION AS TO THE USAGE THEREOF

Susumu Hanyu, and Kenji Kato, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,533
Claims priority, application Japan, Feb. 7, 1983, 58-17530
Int. Cl.[3] D05B 19/00, 3/02
U.S. Cl. 112—121.11 1 Claim



1. A computer sewing machine having a plurality of sewing related operating functions, comprising:

voice generating means driven by a drive signal and producing voice information concerning various information items including at least malfunctioning and explanations thereof, and handling and explanations thereof for the sewing machine;

process designation input means for producing signals for starting the process of said information items produced from said voice generating means;

response input means including at least two switches selectively operated to produce signals to affirm or negate said information items produced by said voice generating means;

reception/discrimination means for receiving said signals from said process designation input means and from said response input means to discriminate the designation of said information items, said reception/discrimination means comparing said signals received with said drive signal to selectively match the designation of said response input means with said information items and producing a signal;

a stitch control device;

malfunction diagnosing means for diagnosing malfunctions of the sewing machine on the basis of control operation of said stitch control device to produce signals indicating a malfunction of the sewing machine;

specifying means for receiving said signals from said malfunction diagnosing means and from said reception/discrimination means to specify said information items, said specifying means being operated to produce a signal in response to the designation of said response input means to specify a next specific information item of said information items;

a language signal storing memory containing language signals; and

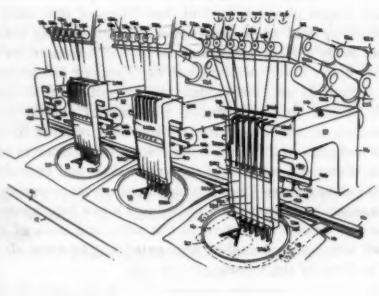
language synthesizing means operated by said signal from said specifying means to read out said language signals from said language signal storing memory regarding said specified information item of said information items in order to synthesize the contents of said information items and produce said drive signal for ddriving said voice generating means.

4,531,467

THREAD TAKE-UP ARM MECHANISM FOR AUTOMATIC COLOR CHANGE EMBROIDERY MACHINERY

Dominick Golia, Jr., 785 Townsend, New Haven, Conn. 06512, and Kenneth R. Golia, 135 Canner St., New Haven, Conn. 06511

Filed Mar. 30, 1984, Ser. No. 595,474
Int. Cl.³ D05B *25/00, 69/02, 49/00*
U.S. Cl. 112—155 **10 Claims**



1. Improved apparatus for rotating one of a plurality of thread take-up arms in a multicolor embroidery machine head in which each thread take-up arm is threaded with a different thread, has a toothed gear section, and is mounted on a carriage for rotation between an arm up position and an arm down position, the embroidery machine head having means for stitching and a drive shaft for providing power to the means for stitching, wherein the improvement comprises:

a linear gear having a frictional surface extending along its periphery;

stroke means connected to the drive shaft for converting the motion of the drive shaft into linear translation of the linear gear between a first stroke position and a second stroke position; and

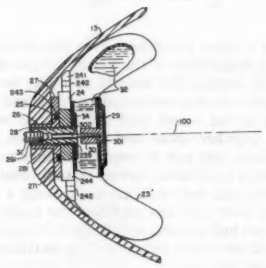
shift means for moving the carriage and selectively placing the toothed gear section of one of the plurality of thread take-up arms in frictional contact with the frictional surface of the linear gear so that as the linear gear moves between the first stroke position and the second stroke position the thread take-up arm rotates between the arm up position and the arm down position.

4,531,468

TEMPERATURE/PRESSURE COMPENSATION STRUCTURE

James F. Simon, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 337,194, Jan. 5, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 624,810
Int. Cl.³ F42B *19/00*; H01L *41/04*
U.S. Cl. 114—21 A **4 Claims**



1. A transducer housing with temperature/pressure compensation attached as a nose cone of a torpedo comprising:

a housing;

a bladder having a front wall, a back wall, and an aperture means and filling a portion of said housing;

first mechanical means attached to and deforming said bladder to cause it to have a deformed volume less than its nondeformed volume, said first mechanical means contacting said bladder front and back walls and operable to pull said back wall towards said front wall;

a first liquid;

said deformed volume bladder filled with said first liquid;

a second liquid;

said second liquid being within a remainder portion of said housing not occupied by said first-liquid-filled deformed volume bladder;

second mechanical means substantially maintaining the deformed shape of said bladder by sealing said first liquid within said deformed bladder;

said housing having a first and second hole providing means;

means providing a seal between said bladder and said housing first hole providing means to prevent the escape of said second liquid from said housing;

means for sealing said second hole providing means and for filling said housing not occupied by said deformed bladder with said second liquid;

said first and second mechanical means adapted to allow release of said first liquid from said deformed bladder;

said bladder being made of a material sufficiently stiff to maintain its deformed shape upon removal of said second mechanical means, removal of a portion of said first mechanical deforming means and release of said first liquid from said deformed bladder; and

a transducer totally immersed in said second liquid filled remainder portion of said housing.

4,531,469

VESSEL COMPRISING TWO PIVOTABLY CONNECTED HULL SECTIONS

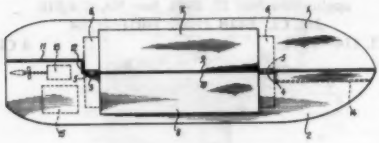
Cornelis A. Brouwer, Oudewater, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Dec. 8, 1983, Ser. No. 559,274

Claims priority, application Netherlands, Dec. 8, 1982, 8204747

Int. Cl.³ B63B *35/30*

U.S. Cl. 114—29 **6 Claims**



1. In a vessel comprising two side-by-side hull sections extending lengthwise of the vessel, hinges interconnecting said two hull sections for vertical swinging movement relative to each other about a horizontal axis disposed above the center of gravity of the vessel, said hull sections being adapted to be swung together about said axis to define a hold and swung apart about said axis to empty the contents of the hold, and a propulsion installation carried by said vessel; the improvement in which said hull sections meet along a plane positioned a distance from said axis such that the transverse cross sections of the two hull sections are unequal along an end portion of the length of the vessel, the propulsion installation being housed in the larger hull section of said end portion on one side of said plane.

4,531,470

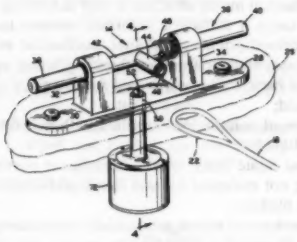
MOORING LINE COUPLER

William A. Paul, 2338 Townley Rd., Toledo, Ohio 43614

Filed Mar. 21, 1984, Ser. No. 591,964

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **8 Claims**



1. Apparatus for aiding in connecting a boat to a mooring unit and in casting off the boat from the mooring unit, said apparatus comprising a cleat having a base and means for mounting the base on an outer surface of the boat, said base having at least one mounting post extending upwardly therefrom, and a bar rotatably supported in an upper portion of said post and extending outwardly therefrom, a projection extending transversely from said bar for engaging a mooring line when in a first position extending toward said base and for releasing the mooring line when in a second position extending outwardly from said cleat, means for urging said projection from said first position toward said second position, a tubular housing affixed to said base and extending therebelow, releasable latch means in said tubular housing for engaging said projection and holding said projection in the first position when said projection is in the first position and when said latch means is in one position, said latch means being spaced from said projection to enable said projection to move toward the second position when said latch means is in another position, means connected to said tubular housing urging said latch means toward the one position, and remotely-controlled means for moving said latch means from the one position to the another position.

4,531,471

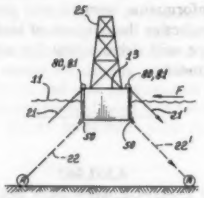
ROLL RESTRAINT OF ANCHORED VESSEL

William A. Hunsucker, 3741 Prestwick Dr., Los Angeles, Calif. 90027

Continuation of Ser. No. 396,633, Jul. 9, 1982, abandoned. This application Sep. 29, 1983, Ser. No. 537,430

Int. Cl.³ B63B *21/50*

U.S. Cl. 114—293 **23 Claims**



1. In combination with a floating vessel having an upper portion with heavy equipment mounted thereon,

(a) means for anchoring the vessel at a selected site on a body of water,

(b) said means including first and second pluralities of anchor lines effectively attached to the vessel and also extending away from the vessel to transfer loading to the vessel at upper and lower locations respectively, said locations associated with the vessel and spaced from the vessel center characterized in that tilting of the vessel is resisted by said lines, said upper locations being above water body surface level, and said lower locations being below water body surface level, each anchor line extending separately and individually to an individual anchor, each of said first and second plurality of anchor lines extending to anchors in initial directions relative to the sides and ends of the vessel, and always maintained in said initial directions relative to the vessel sides and ends during wind and wave force impingement on the vessel during a storm and to resist said wind and wave forces acting from any direction relative to the sides and ends of the vessel, some of said anchor lines extending to areas aft of and in front of the vessel.

4,531,472

INDICATOR AND BARRIER ASSEMBLY FOR PARKING SPACE

Raul Marrero, and Melvin E. Russell, Jr., both of 8460 SW. 47 St., Miami, Fla. 33155

Filed Nov. 23, 1983, Ser. No. 554,548

Int. Cl.³ G08G *1/14*; G09F *19/00*; F16M *11/38*

U.S. Cl. 116—28 R **15 Claims**

1. An indicator assembly of the type primarily designed for mounting in a parking space and structured for vehicle blocking disposition therein, said indicator assembly comprising:

(a) base means for securely mounting said indicator assembly within a vehicle parking space and including a substantially hollow interior portion, said base means comprising a substantially one-piece structured casing reinforcing means for strengthening said casing and connected in at least partially surrounded relation to said casing,

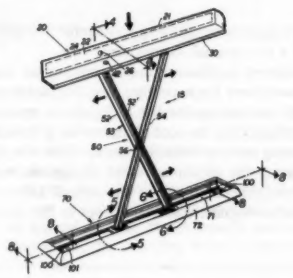
(b) said casing including a hollow interior defining said hollow interior portion of said base means,

(c) a head portion movably interconnected to said base means and structured to extend outwardly therefrom in spaced relation thereto,

(d) support means movably attached to said base means and movably secured in substantially supporting relation to said head portion for support thereof,

(e) said support means comprising a collapsible structure movably attached to both said head portion and said base means and interconnected therebetween,

(f) said collapsible structure disposable between an outwardly extended position, defined by outward disposition of said head portion relative to said base means, and a collapsed position, defined by substantially adjacent relative disposition between said base means and said head portion,



(g) said head portion when collapsed and said base means dimensioned to have a collective height sufficient to pass under a parked vehicle within the parking space,

(h) said hollow interior of said casing being dimensioned and configured to house said support means and said head portion substantially therein when in said collapsed position, and

(i) lid means pivotally connected to said head portion and selectively disposable between an upstanding, exposed position and a reclined position, said lid means dimensioned and configured to substantially cover said hollow interior portion when said lid means is in said reclined position.

4,531,473

SERVICE TOOL FOR PRESSURE INDICATING VALVE

Harry Winther, Box 359 Quaker Neck Rd., Chestertown, Md. 21620

Filed Apr. 13, 1983, Ser. No. 484,617
Int. Cl.³ B60C *23/02*
U.S. Cl. 116—34 R **3 Claims**

1. A valve and low-pressure indicator assembly for a pressurized container comprising:

(a) a tubular housing having an interior wall, an upper end and a downwardly facing seat;

(b) a valve poppet cooperating with the seat;

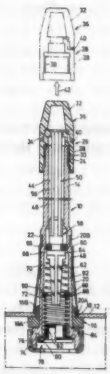
(c) spring means biasing the valve poppet away from the seat, the spring means being overcomeable by air pressure within the pressurized container above a preestablished pressure;

(d) mounting means intermediate the level of the seal and the upper end of the housing for mounting the valve assembly to the pressurized container;

(e) said poppet and seat being located and protected inside the pressurized container;

(f) an indicator piston having a free end reciprocable in the housing and having an upper portion adapted to be seen and indicate low pressure, the piston having an upper position for indicating, a lower position for venting, and a normal position intermediate the two, the piston having a downward extension adapted to engage the poppet and forcibly open it when the piston is moved manually down to the lower position, the piston sealingly engaging the interior wall of the housing except in the venting position; whereby when the pressure in the container drops, the poppet opens and the piston is driven to the indicating position and whereby from the upper end of the housing the container may be vented by pressing down the piston to open the poppet, and gauged or filled by placing a gauge or filling chuck over the top of the housing and pressing the piston down to open the poppet;

a service tool for said valve and low-pressure indicator assembly comprising:



(g) a hollow-cap detachably and depressibly mounted on the upper end of said housing;

(h) said cap including a depending hollow cylinder having a closed end and a fluid flow side opening therethrough;

(i) said closed end of said cylinder being operatively contactable with the free end of said indicator piston for depressing said indicator piston to move the piston to a depressed position to open a fluid passage around said piston and through the upper end of the housing to thereby permit desired venting or complete fluid exhaustion from the container.

4,531,474

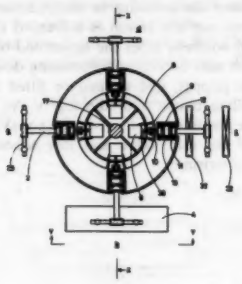
ROTARY BOARD TREATING APPARATUS

Kazuo Inuta, Yokaichi, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 2, 1984, Ser. No. 585,693
Claims priority, application Japan, Jun. 4, 1983, 58-99797
Int. Cl.³ B23Q *1/00*
U.S. Cl. 118—503 **5 Claims**

1. In a rotary board treating apparatus comprising a center shaft, a frame member rotatably supported by said center shaft for the rotation about the shaft, a plurality of upstanding guide beams secured to the frame, a plurality of clamps for holding boards and slidably carried by said guide beams, and means for vertically moving said clamps on said guide beams, the improvement wherein said means for vertically moving said clamps are individually actuatable, said guide beams and said clamps being circumferentially equi-spaced relative to said apparatus and defining a predetermined angle relative to each other, said clamps including a radially extending support arm, with said arm slidably engaging with said upstanding guide beam for the vertical movement thereon, said apparatus further comprising an annular track concentrically supported by said center shaft, with said radially extending arm having at its inner end a member engageable with said annular track, and said annular track having a plurality of circumferentially equi-spaced notches defining said predetermined angle, and said

means for vertically moving the clamps being positioned vertically in alignment with said notches, and said apparatus still



further comprising means for intermittently rotating said frame member, about said center shaft through said angle at each tie.

4,531,475

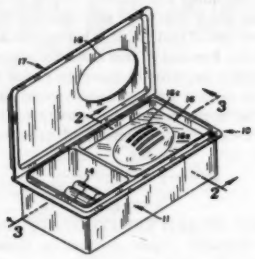
ARTICLE DECORATING DEVICE

Gerald D. Thill, Eden Prairie, Minn., assignor to Spearhead Industries, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 406,317, Aug. 9, 1982, abandoned. This application Apr. 11, 1984, Ser. No. 599,258

Int. Cl.³ B05C *13/02, 17/08*

U.S. Cl. 118—503 **3 Claims**



1. A device for the decorating of eggs, such device including:

a. a base portion providing an egg receiving and support section which support section is arranged and constructed to receive at least a portion of the egg to be decorated therein and providing registration means;

b. an apertured template conformable to the shape of an egg and arranged to overlie the egg to be decorated and arranged and constructed to engage said registration means, said apertures being provided for the introduction of decorating devices therethrough to contact the surface of the egg positioned on said base;

c. template receiving and holding means hingedly attached to said base portion, including a passage therethrough permitting said apertured area of said template to pass therethrough; and,

d. said template holding means and said template being separable, said holding means being arranged and constructed to contact said apertured template to urge the same into registration with said base portion.

4,531,476

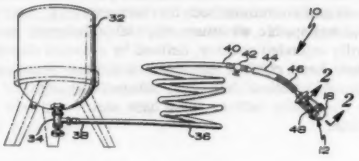
APPARATUS FOR CRYOGENIC BRANDING

David S. Miller, 720-6th Ave. SE., 105, Minneapolis, Minn. 55414

Filed May 14, 1984, Ser. No. 610,135

Int. Cl.³ A01K *11/00*

U.S. Cl. 119—1 **5 Claims**



1. An apparatus utilizing cryogenic material to brand the hide of a live animal, comprising:

cup-shaped applicator means having an end open to the atmosphere for receiving liquid or solid cryogenic material, having means for defining an aperture of varying configuration in accordance with a desired insignia, and having means extending away from the aperture for retaining the liquid or solid cryogenic material and for preventing exposure of the animal hide to the liquid or solid cryogenic material except at the aperture.

4,531,477

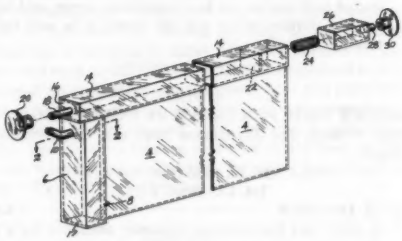
FISH CONCENTRATING DEVICE

Richard B. Crossman, 2451 Second Ave., W., Seattle, Wash. 98119

Filed Apr. 2, 1984, Ser. No. 595,709

Int. Cl.³ A01K *64/00*

U.S. Cl. 119—5 **12 Claims**



11. In combination in an aquarium, apparatus for concentrating fish within a limited volume adjacent to one wall of the aquarium which comprises:

a plate means acting as a barrier wall located adjacent to and generally parallel to one wall of the aquarium so as to define a limited volume which is relatively small compared with the total volume of the aquarium, said plate means being shorter than the adjacent facing aquarium wall and positioned to allow fish access into the limited volume from each end of the plate means;

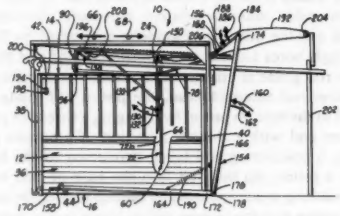
elongated nozzle means mounted along one vertical edge of the plate means, the nozzle means adapted for connection to a water supply and locared so as to direct a curtain of water across one face of the plate means and create a flow of water across the limited volume; and

mounting means for vertically mounting the plate means in the aquarium.

4,531,478
ANIMAL HOLDING CHUTE

William J. Forrest, 3400 N.W. Expressway, Oklahoma City, Okla. 73112

Filed Jun. 14, 1984, Ser. No. 620,631
Int. Cl.[3] A01K *15/00*; A61D *3/00*
U.S. Cl. 119—98 33 Claims



1. An animal holding chute, comprising:

a retaining frame retainingly surrounding an animal holding space and having an entrance formed through a portion thereof, the animal holding space being sized and shaped for accommodating an animal and the retaining frame cooperating to retainingly hold an animal within the animal holding space and the entrance being sized and shaped to permit an animal to pass therethrough and into the animal holding space, the retaining frame comprising:

a first side frame having a forward end, a rearward end, an upper end and a lower end;

a second side frame having a forward end, a rearward end, an upper end and a lower end, the second side frame being spaced a distance from the first side frame; and

a forward side frame extending generally between the first and the second side frames generally near the forward ends of the first and the second side frames, and the first side frame, the second side frame and the forward side frame cooperating to retainingly surround the animal holding space and the rearward ends of the first and the second side frames being spaced a distance apart defining the entrance;

an entrance gate sized and shaped for substantially closing the entrance for substantially preventing an animal from leaving the animal holding space by passing from the animal holding space through the entrance, the entrance gate having an upper end, a lower end, a first side and a second side, the entrance gate being disposed generally near the rearward ends of the first and the second side frames with the first side of the entrance gate being disposed generally near the rearward end of the first side frame and the second side of the entrance gate being disposed generally near the rearward end of the second side frame and the entrance gate extending generally between the first and the second side frames in a start position of the entrance gate, the entrance gate being moved a distance in the direction generally from the rearward ends of the first and the second side frames toward the forward ends of the first and the second side frames as the entrance gate moves from the start position toward an animal holding position; and

a gate support for movably supporting the entrance gate for movement to an opened position and to a closed position and for movement to the start position and to the animal holding position, the gate support supporting the entrance gate near the entrance and the entrance gate being positioned generally within a portion of the entrance in the closed position of the entrance gate for substantially preventing an animal from leaving the animal holding space through the entrance and the entrance gate being removed from at least a portion of the entrance in the opened position of the entrance gate for permitting an animal to pass through the entrance and into the animal holding space, a portion of the entrance gate engaging the rear end portion of the animal as the entrance gate moves from the start position to the animal holding position for moving the animal into an animal holding position within the animal holding space and the entrance gate and the retaining frame substantially surrounding the animal and being disposed near the animal and the entrance gate cooperating with the retaining frame to retain the animal within the animal holding space in the animal holding position of the entrance gate, the gate support being connected to the first and the second side frames generally near the upper ends of the first and the second side frames, one end of the gate support being disposed generally near the rearward ends of the first and the second side frames and the gate support extends a distance generally from the rearward end toward the forward end of the first and the second side frames, the gate support including means for moving the entrance gate from the start position to a plurality of animal holding positions, each animal holding position being spaced a different distance from the forward ends of the first and the second side frames for accommodating animals of different sizes, the gate support comprising:

a gate track assembly connected to the upper ends of the first and the second side frames and extending a distance generally from the rearward ends of the first and the second side frames toward the forward ends of the first and the second side frames;

a carriage movably supported on the gate track assembly for movement in a direction from the rearward ends of the first and the second side frames toward the forward ends of the first and the second side frames and for movement in an opposite direction from the forward ends of the first and the second side frames toward the rearward ends of the first and the second side frames, the entrance gate being connected to the carriage and the carriage being adapted to cooperate in moving the entrance gate from the start position to the animal holding position and for moving the entrance gate from the animal holding position to the start position; and

means for moving the carriage on the gate track assembly from the start position in a direction from the rearward ends of the first and second side frames toward the forward ends of the first and second side frames to the animal holding position, and for moving the carriage on the gate track assembly from the animal holding position in a direction from the forward ends of the first and the second side frames toward the rearward ends of the first and the second side frames to the start position.

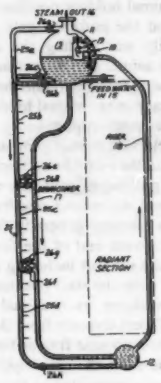
4,531,479
MONITOR SYSTEM FOR VERTICAL BOILERS

Lyman F. Gilbert, 1850 S. Second Ave., Arcadia, Calif. 91106

Filed Mar. 16, 1984, Ser. No. 590,178
Int. Cl.[3] F22B *37/42*
U.S. Cl. 122—504.2 15 Claims

1. In a boiler circuit having water and steam, with an upper region normally occupied by steam at or above a normal water level, and a lower hazardous water level normally occupied by water, the improvement comprising: an equalizer tube extending externally of said boiler as a conduit between said upper region and said hazardous water level; a plurality of sensor means disposed along said tube at respective elevations, said sensors being responsive to the presence or absence of liquid water; a downcomer conduit conducting water between an upper and a lower elevation, said equalizer tube comprising a plurality of segments, each of which extends for less than the full height of the boiler, and in which respective isolation valves connect each of said segments to said downcomer at

two different elevations, and are adjustable to isolate said segments; and



display means to display the response condition of said sensors.

4,531,480

POWER MAGNIFICATION APPARATUS OF A INTERNAL AND EXTERNAL ENGINE

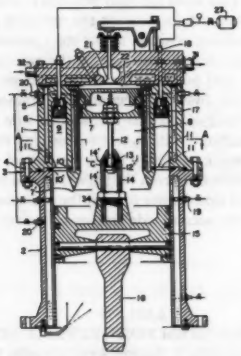
Chul W. Nam, K.P.O. Box 341, Seoul, Rep. of Korea

Filed Nov. 3, 1982, Ser. No. 438,647

Claims priority, application Rep. of Korea, Nov. 5, 1981, 4241/1981; Nov. 14, 1981, 4395/1981; Dec. 9, 1981, 4863/1981

Int. Cl.³ F02B *75/00*

U.S. Cl. 123—19 **2 Claims**



1. A piston power transmission apparatus for an internal combustion engine comprising a piston power transmission apparatus with an upper cylinder block and a lower cylinder block connected together at flange means thereof and having equal internal diameters, a cylindrical vertical wall extending within and from an upper portion of the upper cylinder block to divide the upper cylinder block into an internal chamber and external chamber, a top piston being housed in the internal chamber in which a combustion chamber is formed above the top piston to move up and down inside the vertical wall, an angular ring type piston being mounted in the external chamber communicated through a guide pipe with an outer compressed air tank which employs means for causing the annular ring type piston to move downward toward the lower cylinder block as soon as pressure in the internal and external chamber falls below that within the compressed air tank, a bottom piston being slidably mounted in the lower cylinder block with a larger cross-sectional area than that of the top piston, a piston rod being arranged between the top piston and a piston rod guide in such a manner that its upper end is fixed to the top piston and its lower end is inserted through a top end of the piston rod guide into an inside thereof, and is retained therein via an enlarged head on the piston rod having an outer diameter substantially equal to that of the inside of the piston rod guide and which is spring biased towards the top end of the piston rod guide wherein relative movement between the piston rod and the piston rod guide is controlled by flow of fluid through bores located on opposite ends of and through the piston rod guide in contact with respective opposite sides of the piston rod enlarged head, the piston rod guide being connected to the bottom piston by engaging a threaded portion of its lower end with a threaded portion of a bottom piston projection, a connecting rod being connected to the bottom piston by a piston pin inserted into the base of said bottom piston, a resulting space enclosed by the top piston, the annular ring type piston and the bottom piston being freely communicating and filled with an incompressible fluid oil.

4,531,481

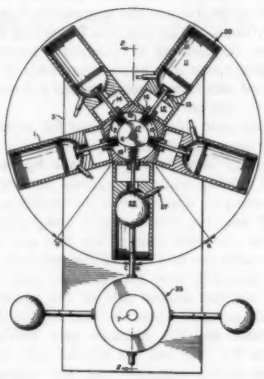
ROTARY CYLINDER DIESEL ENGINE

Nolan F. Haynes, Millwood, W. Va., assignor to James E. Casebolt, Jr. and Barion Casebolt, both of Nitro, W. Va.

Filed Jun. 7, 1984, Ser. No. 618,390

Int. Cl.³ F02B *57/00*

U.S. Cl. 123—44 R **12 Claims**



1. A rotary diesel engine comprising:

five circumferentially spaced, radially distributed combustion chambers mounted on a central hub to orbit in one direction;

four circumferentially spaced radially extending spherical pistons mounted to rotate in a coplanar orbit in the opposing direction;

piston connection rods having one end affixed to a piston, and other end connected to a rod rotation differential for rotating the piston elements and rods about the longitudinal axis of the rods, and

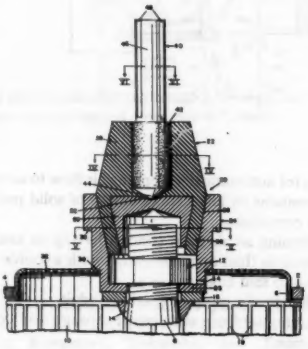
cam and cam follower wheel arrangement mounted parallel to the combustion chamber and piston unit in a gearbox to transfer energy between these units during the interdigitation of the pistons and combustion chambers.

4,531,482

STARTING DEVICE FOR GASOLINE ENGINES

William D. Scheckel, 19716 Millhaven St., Independence, Mo. 64056

Filed Mar. 14, 1983, Ser. No. 475,307
Int. Cl.[3] F02N 11/12
U.S. Cl. 123—179 SE 2 Claims



1. A starting device for a gasoline engine which may be started by spinning the crankshaft thereof, said device consisting of a torque transmission device operable to interconnect an ordinary hand-held electric drill with said crankshaft, and comprising:

a. an internally conical cup,

b. means operable to affix said cup to said crankshaft in coaxial and outwardly opening relation thereto,

c. an externally conical driver cone configurated to be inserted coaxially into said cup in mating engagement therewith, and to be pressed firmly thereinto, the external portion of said cone being formed of a body of resiliently yieldable material whereby to provide better traction against the interior surface of said cup, said cone also including a rigid insert encased within said resilient body, said insert being externally conical and having the same conical generating angle as the exterior surface of said body, concentrically therewith, whereby to provide a layer of said resilient body material having a uniform thickness over a wide area between said insert and said cup, and

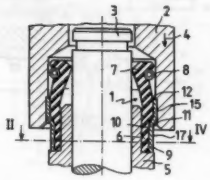
d. a stem carried generally coaxially by said cone and projecting therefrom for fixable engagement in the chuck of said electric drill, one end of said stem engaging said insert and being tapered to a point concentric to both the stem and the insert, whereby said stem may be universally pivoted and axially rotated relative to said insert, the resilient body of said cone being extended to encase a portion of said stem adjacent said cone, and being firmly bonded thereto, whereby to maintain said stem in engagement with said insert, and to resist yieldably both the pivotal and also the rotational movement of said stem relative to said insert.

4,531,483

LIP SEALING RING IN AN INTERNAL COMBUSTION ENGINE

Paul Vossieck, and Hans Deuring, both of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Continuation of Ser. No. 416,713, Sep. 10, 1982, abandoned. This application Oct. 31, 1984, Ser. No. 668,161
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137135; Jun. 14, 1982, 3222356
Int. Cl.[3] F01L 3/08
U.S. Cl. 123—188 P 10 Claims



1. A lip sealing ring for placement, by an installation punch, on a cylindrical support disposed around the valve stem of a poppet valve in an internal combustion engine, comprising

a cylindrical elastic body having a sealing lip at one end and an attachment portion at the other end; and

a reinforcing member having a first portion with a wall having the form of a cylinder that is elongated in the axial direction thereof and that terminates in an end face constituting a base face of the cylinder, said end face being positioned to be in force transmitting engagement with the installation punch, a second portion with a wall having the form of an elongated cylinder that is disposed coaxially with respect to said first portion and that has a smaller diameter than said first portion, the wall thickness of said first and second portions in the radial direction being substantially equal, and a shoulder portion joining said first and second portions,

said reinforcing member surrounding said attachment portion and having only its inside surface bonded to said attachment portion, said reinforcing member being positioned such that said end face is positioned toward said sealing lip.

4,531,484

VIBRATION RESPONSIVE MOUNTING ARRANGEMENT FOR AUTOMOTIVE ENGINE OR THE LIKE

Akira Kimura, Zushi; Masao Ishihama, Yokosuka; Toshiro Abe, Yokohama; Kiyoshi Shimada, and Shinichi Matsui, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 3, 1982, Ser. No. 438,756
Claims priority, application Japan, Nov. 20, 1981, 56-187507; Nov. 20, 1981, 56-187508
Int. Cl.[3] F02B 75/06
U.S. Cl. 123—192 R 13 Claims

1. An arrangement for mounting an engine on a chassis comprising:

an insulator operatively interposed between said engine and said chassis for supporting said engine on said chassis;

means defining a first variable volume chamber in said insulator;

means defining a second variable volume chamber which fluidly communicates with said first variable volume chamber;

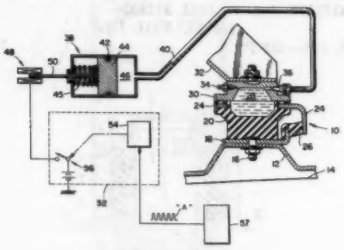
a solenoid operatively connected with said second variable volume defining means for varying the volume of said second variable volume chamber when energized;

a sensor for sensing engine rotational speed and generating a signal indicative thereof; and

a control circuit responsive to the output of said sensor for energizing said solenoid, said control circuit including:

a wave shaping circuit which shapes the signal inputted from said sensor;

a delay circuit which delays the signal inputted thereto from said wave shaping circuit by an amount which varies in accordance with the frequency of said signal;



a duty ratio setting circuit which receives the output from said delay circuit and which produces a pulse train; and

a power amplifier which amplifies said pulse train to a level suitable for energizing said solenoid, and applies said pulse train to said solenoid.

4,531,485

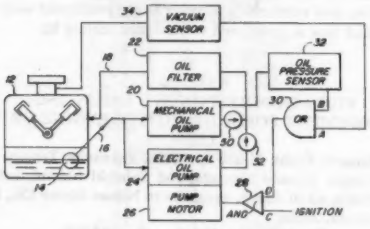
OVER RIDE OIL PUMP

Howard D. Murther, 415 E. 71st St., New York, N.Y. 10021

Filed Mar. 1, 1984, Ser. No. 585,276

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 S **7 Claims**



1. An over ride oil pump comprising in combination a mechanical oil pump which normally delivers oil to an engine which is running; an electrical pump with associated pump motor which pumps oil to said engine at the time of ignition before said engine has come up to speed, during periods of exceptionally high engine speed, and when said mechanical oil pump has failed to deliver sufficient oil pressure; supply means for supplying oil from the engine oil sump to both said mechanical oil pump and said electrical oil pump, in parallel; a filter receiving pumped oil from both said mechanical oil pump and said electrical pump, in parallel, for removing undesired debris from said oil; means for receiving a multiple of signals and combing them for activating said electrical oil pump with associated pump motor, said signals including an ignition signal, an oil pressure signal, and a vacuum pressure signal; and means for preventing said oil from flowing backwards through said mechanical oil pump and said electrical oil pump.

4,531,486

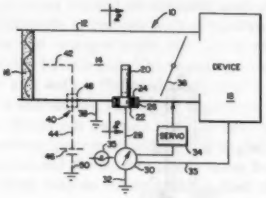
APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF PARTICLES IN A GAS

Robert B. Reif, Grove City, and Loren R. Albrechtson, Gahanna, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 2, 1983, Ser. No. 490,534

Int. Cl.³ G01N *15/00*

U.S. Cl. 123—198 DC **10 Claims**



1. Apparatus for automatically stopping air flow to an engine when the air contains an unacceptable level of solid particles, said apparatus comprising,

means for forming an air tight conduit having an axis, said conduit being in fluid communication with a source of air and leading to said engine,

means for electrically grounding said conduit,

means for pulling air from said source through said conduit to said engine,

a filter in said conduit for collecting solid particles drawn into said conduit from said source, said filter being located in said conduit between said source and said engine and so mounted that all air flowing to said engine must flow through said filter,

means within said conduit between the filter and the engine for imparting an electrical charge to solid particles in said conduit which have passed said filter,

an electrode located in said conduit between said charge imparting means and said engine, said electrode being a hollow cylinder, said cylinder being oriented coaxially with said conduit, said electrode and conduit being configured to require all air reaching said engine to pass through the area circumscribed by said electrode, said electrode having the property of collecting at least some of the electrical charge imparted to said particles as said particles pass through the cylindrical electrode,

means for draining the charge from said electrode and measuring the magnitude of electrical current flow in said draining means,

means for stopping air flow in said conduit when the magnitude of said measured flow reaches a predetermined level.

4,531,487

ENGINE STOPPING DEVICE

Tetsuzo Fujikawa, Kobe; Shinichi Tamba, Kakogawa, and Hitomi Miyake, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

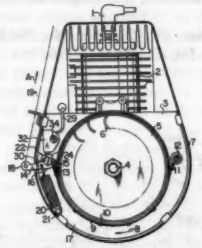
Filed Jan. 4, 1984, Ser. No. 568,149

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 DC **7 Claims**

1. An engine stopping device comprising a contact section for achieving grounding of an ignition circuit to render the engine inoperative, wherein the improvement resides in that:

said contact section for achieving grounding of the ignition circuit is located in an engine cooling air passage defined



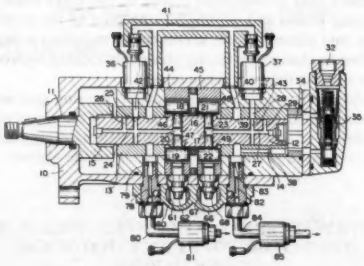
by a peripheral edge portion of a flywheel and an air guide plate radially spaced from said flywheel.

4,531,488

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

Yoshihisa Kawamura, Yokosuka, and Toshiaki Tanaka, Chigasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 18, 1983, Ser. No. 495,661
Claims priority, application Japan, Jun. 4, 1982, 57-82249[U]
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—300 **14 Claims**



1. A fuel injection pump for an internal combustion engine having a rotatable crankshaft and a combustion chamber, the injection pump comprising:

(a) first means for periodically injecting fuel into the combustion chamber as the crankshaft rotates;

(b) second means for adjusting the timing of fuel injection effected by the first means with respect to the rotational angle of the crankshaft;

(c) third means for periodically injecting fuel into the combustion chamber as the crankshaft rotates;

(d) fourth means for adjusting the quantity of fuel injected by the first means during each fuel injection; and

(e) fifth means for adjusting the quantity of fuel injected by the third means during each fuel injection,

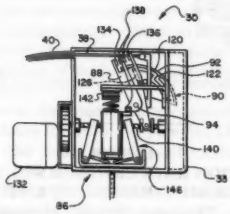
whereby the total fuel injection rate characteristic curve with respect to the rotational angle of the crankshaft can be varied by adjusting the timing of fuel injection effected by the first means.

4,531,489

ENGINE GOVERNOR WITH REFERENCE POSITION FOR THROTTLE LIMITER

Harry D. Sturdy, Wilmington, N.C., assignor to Sturdy Truck Equipment, Inc., Wilmington, N.C.

Continuation of Ser. No. 168,566, Jul. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 36,064, May 4, 1979, abandoned. This application Mar. 7, 1983, Ser. No. 471,904
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—320 **29 Claims**



1. A speed-limiting governor for use with an engine having a throttle means mechanically movable between an open position and a closed position to regulate the flow of energy-supplying means to said engine, said governor comprising

(a) means for sensing the speed of said engine;

(b) means adapted to be connected to said throttle means for selectively overriding said mechanical operation thereof, said overriding means being movable in a first direction toward a closed throttle position and in a second direction toward an open throttle position, and being movable to a predetermined reference position intermediate said open and closed throttle positions; and

(c) control means responsive to said speed sensing means for moving said overriding means in said first direction to said predetermined reference position when said engine speed reaches a first preset level.

4,531,490

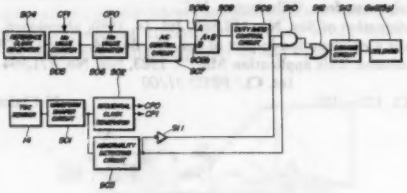
IDLING SPEED FEEDBACK CONTROL METHOD HAVING FAIL-SAFE FUNCTION FOR ABNORMALITIES IN FUNCTIONING OF CRANK ANGLE POSITION-DETECTING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Noriyuki Kishi, Tokyo; Takashi Koumura, Saitama, and Takehiko Hosokawa, Yokohama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,789
Claims priority, application Japan, Jun. 22, 1983, 58-112294
Int. Cl.³ F02M *3/06*
U.S. Cl. 123—339 **3 Claims**

1. An idling speed control method which is adapted to detect by detecting means predetermined rotational angle positions of an internal combustion engine having supplementary air supply control means which regulates the quantity of supplementary air being supplied to said engine, and to control the ratio of operating duty of said supplementary air supply control means to an interval of time at which pulses of a signal indicative of the predetermined rotational angle positions are generated, in a feedback manner responsive to the difference between actual idling engine speed and desired idling speed, the method comprising the steps of: (a) detecting whether or not there is an abnormality in said detecting means, and (b) supply-

ing a maximum quantity of supplementary air to said engine by operating said supplementary air quantity control means to an



operating limit thereof, when an abnormality is detected in said detecting means.

4,531,491

FUEL INJECTION RATE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

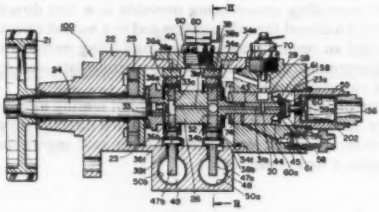
Akihiro Iiyama, Yokosuka; Hiroaki Miyazaki, Kamakura; Yukihiro Etoh, Yokohama, and Toshiaki Tanaka, Chigasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 30, 1983, Ser. No. 556,606

Claims priority, application Japan, Dec. 6, 1982, 57-212640; Feb. 14, 1983, 58-19004

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—357 **7 Claims**



1. A fuel injection rate control system for an internal combustion engine, comprising:

(a) a fuel injection pump for periodically injecting fuel into the engine;

(b) a movable control member associated with the fuel injection pump for determining the quantity of fuel injected during each fuel injection stroke in accordance with the position of the control member;

(c) a truncated-cone-shaped permanent magnet movable together with the control member and having an axis parallel to the direction of movement of said permanent magnet;

(d) a stationary magnetically-permeable member having a portion lying radially outward of the permanent magnet for conducting magnetic flux generated by the permanent magnet, the magnetic flux conducted by the magnetically permeable member depending on the position of the control member;

(e) a Hall element unit associated with the magnetically permeable member for sensing the magnetic flux conducted by the magnetically permeable member and for generating a first signal indicative thereof and hence indicative of the actual position of the control member;

(f) means for generating a second signal indicative of a desired position of the control member; and

(g) means, responsive to the first and second signals, for adjusting the actual position of the control member to the desired position thereof.

4,531,492

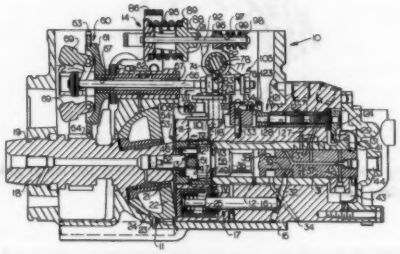
FUEL INJECTION TIMING AND GOVERNOR CONTROL APPARATUS

Dennis H. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1984, Ser. No. 593,982

Int. Cl.³ F02M *41/06*

U.S. Cl. 123—364 **11 Claims**



1. A fuel injection apparatus including a housing having a bore and a delivery passage and a plurality of outlet ports in communication with the bore, a distributor rotor rotatably mounted in the bore, pumping means for delivering charges of fuel to the delivery passage at timed intervals and including a drive shaft, said distributor rotor being driven in timed relationship to the drive shaft of the pumping means for synchronizing the distribution of fuel charges from the delivery passage to the outlet ports, a metering collar rotatably mounted on the distributor rotor and adapted to meter the quantity of fuel transmitted through the outlet ports, and a speed responsive device driven by the drive shaft of the pumping means and including an element movable in response to changes in the speed of the pumping means comprising:

a planetary gear arrangement driven by the drive shaft of the pumping means and drivingly connected to the distributor rotor, said planetary gear arrangement including a ring gear adapted to change the timing phase relationship between the rotor and the delivery passage; and

means for mechanically connecting both the ring gear and the metering collar to the movable element of the speed responsive device so that said ring gear and said metering collar are both rotated in response to movement of the element.

4,531,493

INJECTION INTERNAL COMBUSTION ENGINE WITH SUPERCHARGING BY AN EXHAUST GAS TURBOCHARGER

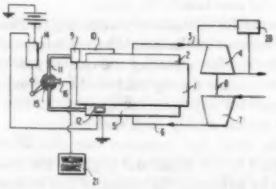
Manfred Fortnagel, Korb, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 28, 1978, Ser. No. 882,060

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709667

Int. Cl.³ F02B *77/08*; F02D *23/02*

U.S. Cl. 123—383 **2 Claims**



1. A fuel-injected internal combustion engine comprising a

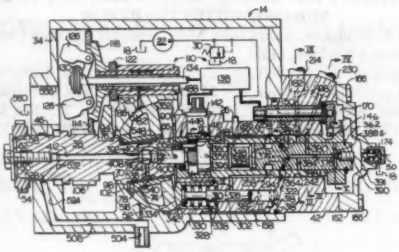
fuel-injection pump operatively connected to the engine, supercharging means operatively connected to an intake manifold means and exhaust manifold means of the engine, said supercharging means including an exhaust gas turbine means and a compressor means adapted to be driven by said turbine means, a by-pass control means provided at least one of the turbine means and compressor means for limiting a maximum supercharging pressure of the supercharging means, means for adjusting injection quantities of fuel for operation of the internal combustion engine with and without supercharging, the adjusting means including a control member provided at the fuel injection pump which is adapted to be acted upon by the supercharging pressure, and connecting line means arranged between the intake manifold means and the control member for enabling the supercharging pressure to act upon the control member, characterized in that a pressure-responsive means is operatively connected to the supercharging means for providing a noticeable indication to an operator of the engine that a predetermined maximum critical pressure has been exceeded in the intake manifold means of the engine, said pressure-responsive means includes a pressure transmitter means acted upon by the supercharging air, a valve means is arranged in the connecting line means for controlling the amount of supercharging pressure acting upon the control member, means are provided for connecting a section of the connecting line means disposed between the valve means and the control member with a pressure considerably lower than a pressure prevailing in the intake manifold means so as to reduce the power output of the engine, and in that the pressure responsive means is operable to close the valve means upon the supercharging pressure exceeding a predetermined critical maximum pressure.

4,531,494

DISTRIBUTOR FUEL INJECTION PUMP HAVING A NUTATOR PUMP SUBASSEMBLY

John M. Bailey, Dunlap; Dennis H. Gibson, Edelstein; David E. Hackett, Washington; Alan R. Stockner, Chillicothe, and Donald J. Waldman, Brimfield, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1984, Ser. No. 594,009
Int. Cl.³ F02M *41/06*
U.S. Cl. 123—450 **5 Claims**



1. A distributor fuel injection pump adapted for sequentially supplying pressurized fuel to individual combustion cylinders of an internal combustion engine, comprising:

a housing defining a concave internal semi-spherical surface, a pumping chamber, and a plurality of high pressure fuel outlet passages equaling the total number of engine combustion cylinders that the pump is adapted to supply;

a drive shaft journaled for rotation in the housing, said drive shaft including a primary longitudinal axis of rotation and an oblique journal having a crank axis which is bent at a preselected angle relative to said primary longitudinal axis;

a semi-spherical nutator member journaled for free rotation around said oblique journal, said nutator member having a convex semi-spherical outer surface which is complementary to and is supported by the concave internal surface of the housing, said nutator member further including an actuating surface;

at least one pump plunger positioned in the pumping chamber of the housing and adapted to be reciprocated by said actuating surface;

a distributor rotor rotatively disposed in said housing and being axially spaced from said drive shaft, said distributor rotor including at least one peripheral axial fuel supply slot having a peripheral scroll adapted to intermittently communicate relatively low pressure fuel to the pumping chamber, at least one radially outwardly extending distributor fuel outlet passage adapted to sequentially communicate relatively high pressure fuel to the high pressure fuel outlet passages of the housing, and at least one radial fuel spill passage;

passage means for intermittently communicating relatively high pressure fuel from the pumping chamber to the distributor fuel outlet passage and to the radial fuel spill passage of the distributor rotor;

angular speed reduction means for rotatively driving the distributor rotor with the drive shaft to rotate the distributor rotor at a preselected output angular speed which is less than a preselected input angular speed of the drive shaft, wherein said angular speed reduction means is a planetary gear reduction mechanism having a normally stationary ring gear positioned in the housing, said ring gear being rotatively adjustable relative to the housing to change the angular phase between the drive shaft and the distributor rotor to thereby control the timing of fuel injection; and

a fuel metering collar rotatably mounted around a portion of said distributor rotor and having at least one radial fuel spill port therethrough which lies in a plane containing said radial fuel spill passage of the distributor rotor, wherein the total number of fuel spill ports of the fuel metering collar times the total number of radial fuel spill passages of the distributor rotor equals the total number of high pressure fuel outlet passages of the housing.

4,531,495

FUEL SUPPLY CONTROL METHOD HAVING FAIL-SAFE FUNCTION FOR ABNORMALITIES IN ENGINE TEMPERATURE DETECTING MEANS AT THE START OF THE ENGINE

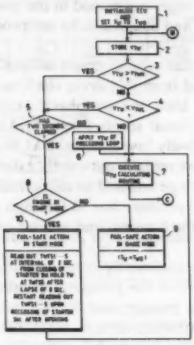
Akihiro Yamato, and Yutaka Otobe, both of Shiki, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1983, Ser. No. 493,978
Claims priority, application Japan, May 20, 1982, 57-85316
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—479 **15 Claims**

1. A method for electronically controlling the quantity of fuel supply to an internal combustion engine including detecting a temperature of the engine, detecting an abnormality in an engine temperature detecting signal, employing a dummy signal indicative of engine temperature in place of said temperature detecting signal when said abnormality is detected, and increasing the quantity of fuel being supplied to the engine with the lapse of time by the use of dummy signal.

5. Apparatus for electronically controlling the quantity of fuel supply to an internal combustion engine having means for detecting a temperature of the engine and producing a temperature signal, comprising means for detecting an abnormality in the functioning of said engine temperature detecting means, means for employing a dummy signal indicative of engine

temperature in place of said temperature signal when said abnormality is detected, and means for increasing the quantity



of fuel being supplied to the engine with the lapse of time by the use of the value of said predetermined dummy signal.

4,531,496

FUEL INJECTION PUMPS

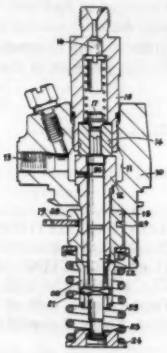
Gerald S. Thomas, Longlevens; John Punshon, Hucclecote, and John A. Barr, Longlevens, all of England, assignors to Lucas Industries, Birmingham, England

Filed Jun. 24, 1982, Ser. No. 391,964

Claims priority, application United Kingdom, Jul. 10, 1981, 8121312

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—495 **6 Claims**



1. A fuel injection pump for supplying fuel to an internal combustion engine comprising a plunger reciprocable within a pump barrel, a sleeve mounted about the barrel, interengaging means on the plunger and sleeve whereby the plunger can partake of axial movement relative to the sleeve but angular movement of the sleeve will be transmitted to the plunger, means carried by the sleeve whereby the angular setting of the sleeve can be varied, said means comprising a groove in the outer periphery of said sleeve, said groove extending circumferentially about said sleeve, a recess in the outer periphery of said sleeve, said recess extending axially of said sleeve and intersecting said groove, a rotatable arm having a projection thereon shaped to snugly seat within said recess for coupling said arm to said sleeve so said sleeve is rotated when said arm is rotated, and a pair of limbs extending from the arm in opposite directions, said limbs being received in said circumferential groove and being shaped to at least partly embrace the sleeve to retain said projection within said recess.

4,531,497

NATURAL GAS ADAPTOR SYSTEM FOR AUTOMOBILES

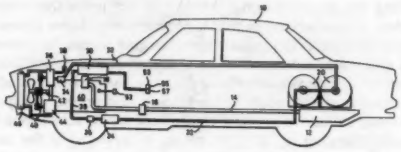
Robert W. Smith, Stouffville, Canada, assignor to Eneroil Research Ltd., Concord, Canada

Filed May 9, 1982, Ser. No. 492,708

Claims priority, application United Kingdom, Oct. 4, 1982, 8228259

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—525 **9 Claims**



1. In a vehicle having an internal combustion engine adapted to run both on gasoline and on natural gas, and a gasoline tank adapted to feed gasoline through a carburetor to the engine, a gas charging system comprising:

storage means adapted to store natural gas under a given storage pressure,

delivery means through which natural gas can be delivered from the storage means through an air-mixing means to the carburetor.

a compressor adapted to receive low-pressure natural gas and to compress it up to the storage pressure,

drive and fuel delivery means by which the engine directly drives the compressor while the engine is being fuelled by gasoline from the gasoline tank,

and conduit means from the output of the compressor to the storage means.

4,531,498

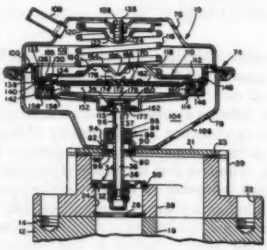
EXHAUST GAS RECIRCULATION CONTROL AND SUBASSEMBLIES THEREFOR

Cyril E. Bradshaw, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 921,392, Jul. 3, 1978, Pat. No. 4,196,744, and a continuation of Ser. No. 31,667, Apr. 19, 1979, abandoned, said Ser. No. 921,392, is a continuation of Ser. No. 725,069, Sep. 21, 1976, abandoned. This application Jan. 27, 1981, Ser. No. 228,861

Int. Cl.³ F02B *47/08*

U.S. Cl. 123—568 **2 Claims**



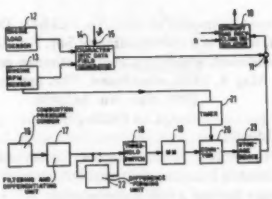
1. An exhaust gas recirculating device for use in an internal combustion engine, comprising:

(a) upper housing means defining a fluid chamber communicating with a fluid pressure source;
(b) lower housing means defining an exhaust gas chamber having an inlet passage and an outlet passage communicating therewith;
(c) pressure transducer means movably disposed within said upper housing means and responsive to pressure variations in said exhaust gas for movement therein;
(d) stem means connected to said transducer means, said stem means defining a passage communicating exhaust gas from said exhaust gas chamber to said pressure transducer means;
(e) a valve seat intermediate said inlet and outlet passages;
(f) valve means movable with respect to said valve seat for controlling flow of exhaust gas from said inlet passage through said outlet passage, said valve means being operatively connected to said stem means for movement therewith;
(g) means for resiliently guiding and sealingly engaging said stem means, said guiding means being effective for permitting misalignment and axial movement of said valve stem member therein, said guide means including
(i) said lower housing means including portions having a first aperture formed therein;
(ii) said upper housing means including portions having a second aperture formed therein, said first and second apertures being disposed in coaxial alignment;
(iii) a tubular member having a portion thereof extending through said first and second apertures, said portion having upper and lower enlarged diameter sections for retaining said upper and lower housings therebetween; and
(iv) a resilient bearing means disposed within said tubular member and retained therein, said bearing means defining an axial bore therethrough with said stem means received therein, said resilient bearing means permitting misalignment of said valve stem with respect to said first and second apertures and axial movement therein; and
(h) means for attaching said valve means to said valve stem means, said attaching means being effective for permitting misalignment of said stem means with respect to said valve seat while maintaining said valve means in sealing contact with said valve seat.

4,531,499
CONTROL DEVICE FOR REGULATING THE EXHAUST GAS RECYCLING RATE IN AN INTERNAL COMBUSTION ENGINE WITH SELF-IGNITION

Konrad Eckert; Wolfgang Ripper, both of Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,286
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137390
Int. Cl.³ F02M *25/06;* **F02D** *21/08*
U.S. Cl. 123—571 **12 Claims**



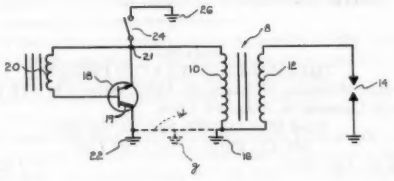
1. A method of controlling a device for regulating the exhaust gas recycling rate in an internal combustion engine with self-ignition, the improvement comprising;
detecting the combustion pressure in at least one cylinder of the engine and forming an actual-value number of occurrences which exceed a threshold value within a duration of a set time period of a timer;
generating a nominal value signal dependent on engine operating characteristics and forming a set-point number of times a threshold value is exceeded within a duration of a set time period of said timer; and
influencing an exhaust gas recirculation rate in accordance with the actual-value and set-point numbers.

4. In a control device for regulatng an exhaust gas recycling rate in an internal combustion engine with self-ignition, the improvement comprising:
means for detecting a combustion pressure in at least one cylinder of the engine within a duration of a set time period;
means for forming an actual-value signal for each pressure occurrence which exceeds a threshold value within a set time period of a timer;
means for generating a nominal value signal dependent on engine operating characteristics;
means for forming set-point signals for a number of times a threshold value is exceeded within a duration of a set time period of a timer; and
means for influencing an exhaust gas recirculation rate in accordance with a number of actual-value signals and a number of set-point signals occuring during said set time period.

4,531,500
FAIL SAFE IGNITION CUT-OFF SYSTEM

Bob O. Burson, Somers, Conn., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Apr. 19, 1984, Ser. No. 602,124
Int. Cl.³ F02P *1/00;* **F02B** *77/00*
U.S. Cl. 123—630 **7 Claims**



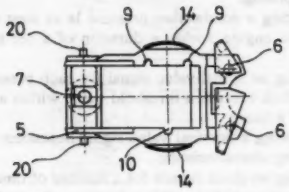
1. In a breakerless electronic ignition system having an ignition transformer with inductively coupled primary and secondary windings disposed on a ferromagnetic, flux carrying core and with an electronic switching circuit disposed within a unitary housing with said transformer for controlling the current flow in the primary winding in response to rotation of a permanent magnet past the core, the improvement comprising a cut-off switch having one side connected to the electronic circuit and the other side connected to a grounded terminal, a second ground terminal connected to one end of the primary winding within said housing and a third ground terminal connected to said electronic circuit at a point electrically separated, within said housing from the connection of the second terminal to the primary winding, said terminals having other ends connected to a grounded structure externally of said housing whereby said ignition system will be grounded out or open circuited despite the disconnection of either or both of said second and third ground terminals.

4,531,501

IGNITION COIL FOR INTERNAL COMBUSTION MOTOR

Jonny Croissant, Roissy en Brief, France, assignor to Ducellier et Cie, Creteil, France

Filed Jul. 19, 1984, Ser. No. 632,556
Claims priority, application France, Jul. 21, 1983, 83 12050
Int. Cl.³ F02P *3/02*
U.S. Cl. 123—634 **3 Claims**



1. An ignition coil for internal combustion motors, comprising:

an insulating casing (1),

a primary winding (4) and a secondary winding (3) concentrically disposed around a branch of a closed magnetic circuit (2),

a support (5) for supporting said windings and electrical connections (6 and 7) therefor, said support including means for positioning and maintaining in position said windings before they are mounted in said casing comprising a pair of elastically deformable tongues (14), extending downward from said support (5), said tongues defining curved outer surfaces and flanges (14*a*) at their ends,

a winding form (15) upon which said secondary winding (3) is wound, said winding form (15) defining a central, generally cylindrical opening for receiving said pair of elastically deformable tongues (14) and notches in the surface of said opening for engaging said flanges (14*a*), and

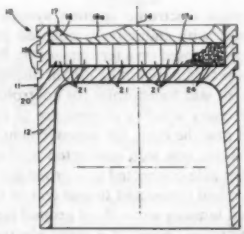
means attaching the output terminal (16) of said secondary winding (3) directly to the high tension electrical connection (7) mounted on said support (5).

4,531,502

THERMALLY INSULATED PISTON

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 18, 1983, Ser. No. 495,849
Int. Cl.³ F01B *31/08*; F16J *1/00*
U.S. Cl. 123—668 **7 Claims**



1. A piston for use in an internal combustion engine having a combustion chamber and having a longitudinal axis, comprising

a main body having a wall defining part of said combustion chamber,

said wall having a central recess with a bottom and a cap in said recess and a heat barrier disposed between and secured to said cap and the bottom of said recess,

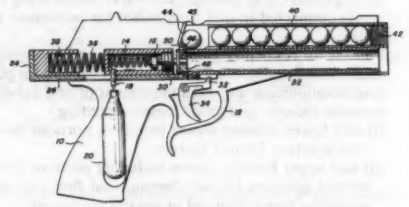
said barrier comprising a honeycomb structure containing thermal insulating material.

4,531,503

FLUID PRESSURE REPEATING PISTOL WITH UNITARY BARREL AND HAMMER ASSEMBLY

Robert G. Shepherd, 1513 Sewanee Dr., West Columbia, S.C. 29169

Filed Feb. 21, 1984, Ser. No. 581,535
Int. Cl.³ F41B *11/06*
U.S. Cl. 124—76 **3 Claims**



1. A repeating pistol of the fluid pressure powered type comprising:

a main frame including a handle portion;

means defining a closed chamber fixedly mounted on said main frame and including means affording connection of said chamber to a source of fluid pressure, and having a normally closed valve at its forward end;

a unitary assembly slidably mounted on said main frame including a barrel forwardly of and a hammer rearwardly of said chamber, said assembly being biased rearwardly and movable between a forward cocked position, a rearmost firing position and a fired or rest position just forward of the firing position;

a trigger pivotally mounted on said frame and having a sear engageable with said assembly for releasably holding said assembly in forward cocked position;

and sealing means carried by said valve and engageable by the rear of said barrel to establish sealed temporary fluid communication between said chamber and the rear of said barrel when said barrel moves from its cocked to its firing position;

said hammer in its rest position extending rearwardly of said main frame and handle portion whereby a user may cock the pistol while holding it substantially in firing position by merely slapping the hammer with his other hand.

4,531,504

BALL EXPELLING DEVICE

Donald L. Gilreath, 3181 W. 95th Ave., Westminster, Colo. 80030

Continuation-in-part of Ser. No. 212,843, Dec. 4, 1980, abandoned, which is a continuation of Ser. No. 936,565, Aug. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 902,976, May 4, 1978, abandoned. This application Jan. 31, 1983, Ser. No. 462,466
Int. Cl.³ F41B *15/00*
U.S. Cl. 124—78 **20 Claims**

1. A ball expelling device adapted for forceably expelling a ball in a variable manner, comprising:

a container having a ball exit opening;

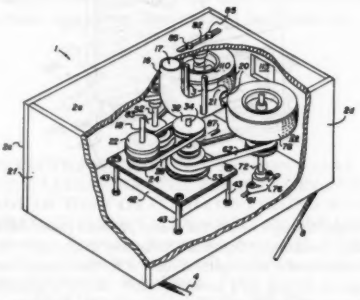
a first wheel having a first peripheral surface and mounted on a first axle, said first axle journaled for rotation in said container;

a second wheel having a second peripheral surface and mounted on a second axle, said second axle journaled for rotation in said container, said first and second axles being

oriented in substantially parallel relation to one another whereby said first and second wheels are positioned in a generally common first plane with said first and second peripheral surfaces in facing relation to one another, said first and second axles defining a second plane;

drive means associated with said first and second wheels for rotating said first and second wheels in opposite directions;

a ball feed tube having an inlet opening and an outlet opening, said tube being mounted in said container such that said outlet opening is positioned between said first and second peripheral surfaces;



a first adjustment means connected to said tube for moving said outlet opening in a first direction generally perpendicular to said first plane;

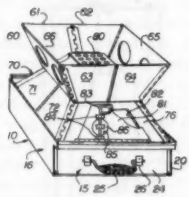
a second adjustment means connected to said tube to permit said outlet opening to move in a second direction generally perpendicular to said second plane, said first and second adjustment means operable independently of one another so that said outlet opening may be moved independently in two different directions, and said first and second adjustment means enabling the outlet opening to be adjustably positioned relative to the first and second wheels so as to vary the types of pitched balls.

4,531,505

CONVERTIBLE COOKING UNIT WITH AN OVEN

Paul W. Hait, Los Gatos, Calif., and Dan Rohrer, Redmond, Oreg., assignors to Pyromid, Inc., Saratoga, Calif.

Filed Jun. 9, 1983, Ser. No. 502,689
Int. Cl.³ F24C *1/16*
U.S. Cl. 126—9 R **15 Claims**



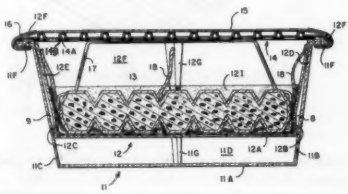
1. A cooking unit comprising an open-ended support member of truncated pyramidal configuration, said support member having a smaller end, an open-ended firebox of truncated pyramidal configuration disposed below and in axial alignment with said support member, said firebox having a smaller end, said smaller end of said firebox projecting through the opening in the smaller end of said support member, oven means defining an enclosed cooking chamber disposed at times below said firebox to support said firebox and at other times disposed above said support member to be supported by said support member, said oven means providing a base for said cooking unit when disposed below said firebox, a cover disposed below said firebox to provide a base for said cooking unit when said oven means is disposed above said support member, said oven means comprising a planar top wall having upstanding flanges along the perimeter thereof, said cover comprising depending flanges along the perimeter thereof cooperating with said upstanding flanges of said top wall of said oven means to define an enclosed space, said firebox being collapsible to a relatively flat form and positionable in said space, said support member being collapsible to a relatively flat form and positionable in said space, said firebox when in a collapsed state and said support member when in a collapsed state being disposed generally parallel to the top wall of said oven means when positioned in said space, and means for locking said cover over said oven means when said firebox in a collapsed state and said support member in a collapsed state are positioned in said space.

4,531,506

PORTABLE DISPOSABLE GRILLING

Carl E. Chambers, and Paul A. Brogioli, both of 15M Alfred Rd., Milford, Mass. 01757

Filed Apr. 27, 1984, Ser. No. 604,382
Int. Cl.³ F24C *1/16*
U.S. Cl. 126—9 A **6 Claims**



1. Grilling apparatus comprising, inner tub means for supporting burning charcoal,

outer tub means for supporting said inner tub means,

said inner tub means nested in said outer tub means with a significant air gap therebetween,

aluminum grill means supported by said inner tub means for supporting items to be grilled,

said aluminum grill means having a plurality of ribs extending from one side of said grill means to an opposed side thereof with openings between adjacent ribs,

respective insulators contiguously beneath each of said ribs clear of said openings,

said inner tub means and outer tub means having side walls diverging upward and outward from the bottom of each,

said inner tub means being formed with a bottom portion having vertical sides, and

a charcoal package seated in said inner tub means wherein the vertical sides of said inner tub means helps snugly accommodate the charcoal package.

4,531,507

CHARCOAL LIGHTER DEVICE

Fred B. Gerson, 408 Sterling St., Jackson, Tenn. 38301

Filed Apr. 13, 1984, Ser. No. 600,121
Int. Cl.³ F24B *3/00*
U.S. Cl. 126—25 B **16 Claims**

1. A charcoal lighter device comprising:

a tubular housing adapted to rest vertically on a support surface,

a handle assembly positioned outside of and attached to said housing,

a grate having a first edge pivoted in said housing and an opposite second edge, and

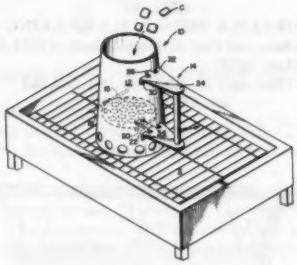
a pivoting means for pivoting said first edge to said housing,

a grate support finger connected to said handle assembly and

positionable, by the movement of said handle assembly relative to said housing, between an extended grate support position and a grate release position,

said second edge being positionable on said grate support finger such that said grate is in a generally horizontal charcoal support position spaced above the support surface when said grate support finger is in said grate support position, and said second edge pivoting downwardly from said generally horizontal position to a charcoal dumping position when said grate support finger is moved to said grate release position,

said second edge including an edge member extending generally perpendicularly down from said grate and adapted to rest on said grate support finger when said grate support finger is in said grate support position, and positioned to be spaced a distance from the support surface so that said grate can freely pivot to said charcoal dumping position when said grate support finger is in said grate release



position, even when said housing is resting on the support surface,

said grate support finger being slidably positioned in a finger opening in said housing spaced above the lower surface of said housing,

a blocking means attached to said grate support finger inside said housing and adapted to prevent said grate support finger from being pulled entirely out through said finger opening to the outside of said housing when said grate support finger is in said grate release position,

said handle assembly including an upper bracket connected to said housing, a lower bracket spaced below said upper bracket and connected to said grate support finger, and a generally vertical handle extending between and mounted to said upper bracket and said lower bracket, and

said blocking means allowing said handle to be generally parallel to the longitudinal axis of said housing when said housing has been fully lifted off of the support surface by a user grasping and lifting said handle.

4,531,508

GAS-FIRED CONVECTOR OR CONVECTOR/RADIANT ROOM HEATING APPLIANCE

Jalil Niknejad, and Ming-Biu Tung, both of London, England, assignors to British Gas Coporation, London, England

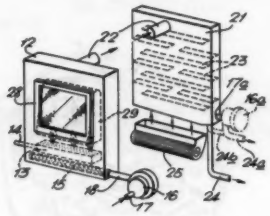
Filed Jul. 24, 1984, Ser. No. 633,914

Claims priority, application United Kingdom, Nov. 1, 1983, 8329152

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—90 R **9 Claims**

1. A gas-fired convector or convector/radiant room heating appliance comprising, a gas burner, a combustion chamber with or without radiant elements into which the combustion products from the burner are directed, a heat exchanger located adjacent to but spaced from the combustion chamber over which ambient air can flow, a passageway connecting the heat exchanger with the combustion chamber for the flow of combustion products from the top of said combustion chamber to the top of said heat exchanger, and a flue outlet connected to the bottom of the heat exchanger through which waste combustion product gases can be discharged, the improvement wherein the appliance is a condensing gas-fired room heater and wherein the combustion chamber and the heat exchanger are sealed inter-communicating box-like units, the gas burner is contained within the sealed combustion chamber, combustion air for said burner is provided by a high pressure air blower, a convector fan is provided beneath the heat exchanger for providing air flow over the surfaces of at least the heat exchanger, and the flue outlet is provided by a length of small



bore pipe through which the waste product gases and resultant product condensate liquid are forceably discharged therealong in a substantially horizontal direction by the draught generated by said air blower to a terminal outlet means connected to the small bore flue pipe and located outside the building in which the room is situated, the whole arrangement being such as to ensure that the thermal efficiency of the appliance is at least 90% of the potential heat source available at the burner and that the temperature of the waste product gases leaving the heat exchanger is below the dew point of gases and at less than 50° C.

4,531,509

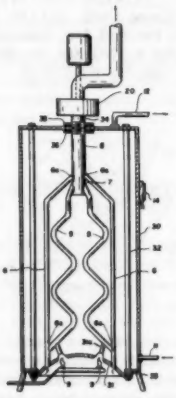
AUTOMATIC WATER HEATER SYSTEM

Robert O. Wilhelm, Jr., 3720 Wayne Rd., Munhall, Pa. 15120

Filed May 11, 1983, Ser. No. 494,980

Int. Cl.³ F24H *1/00*

U.S. Cl. 126—362 **4 Claims**



1. In an automatic hot water heater system comprising an insulated tank having contained therein, an upwardly bowed bottom, a plurality of serpentine flame tubes extending generally vertically of the tank, a plurality of heat tubes surrounding and connected to the lower end portions of said flame tubes,

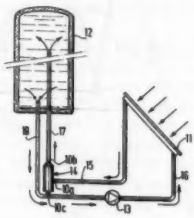
said heat tubes having inlets at the periphery of said bottom, flame tube inlets extending upwardly of said bottom at a higher elevation than said heat tube inlets and connected to said flame tubes, an exhaust outlet extending through the top of said tank and connected to said serpentine flame tubes and to said heat tubes, a blower in said exhaust outlet above said tank, water inlet and outlet connections extending to the bottom and top of said tank, respectively, a fuel burner jet for heating said bottom and said flame tubes and heat tubes through all of said inlets between the bottom of said tank and said respective serpentine flame tubes and heat tubes for circulating heated air through said flame tubes and heat tubes and said exhaust outlet, thence through a chimney, whereby any condensation drained downwardly through said serpentine flame tubes will be diverted to said heat tubes away from flames of said fuel burner jet.

4,531,510

BIDIRECTIONAL THERMAL SYPHON VALVE, INSTALLATION FOR THE PRODUCTION AND STORAGE OF HEAT OR COLD COMPRISING SUCH A THERMAL SYPHON VALVE, AND VARIOUS USES

Roland Barthez, Boulogne; Francisque Boissonnet, Paris, and René Bogo, Clichy-la-Garenne, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Dec. 19, 1983, Ser. No. 563,304
Claims priority, application France, Dec. 21, 1982, 82 21453; European Pat. Off., Oct. 27, 1983, 83402104.0
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 **20 Claims**



1. Installation for the production and storage of heat recovered at an outlet of a heat-producing source that produces heat intermittently comprising

a thermal siphon-valve, for directing the flow of a heat transfer liquid, formed of a tubular hollow body having a vertically oriented axis, at least one inlet orifice located along the axial length of said body, and upper and lower outlet orifices located respectively in upper and lower end portions of said tubular body with said inlet orifice therebetween and with all of said orifices being in continuous physically open communication with one another;

a storage tank located to have a hydrostatic head at a higher elevation than said thermal siphon-valve;

a source circuit including an inward-flow conduit coupled from said source to the inlet orifice of said tubular body and a return-flow conduit coupled from said source to the lower outlet orifice of said tubular body;

a tank circuit comprising an inlet conduit coupled to said storage tank from the upper outlet orifice of said tubular body, and an outlet conduit coupled from said storage tank to the return-flow conduit of said source conduit; and

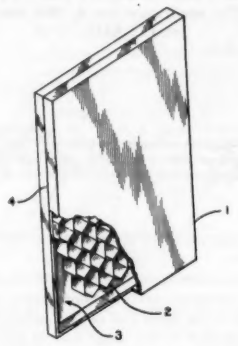
pumping means in said source circuit for pumping the heat transfer liquid in said source circuit between said source and said thermal siphon-valve.

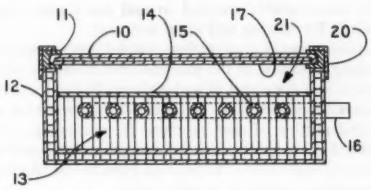
4,531,511

MEANS FOR CONTROLLING HEAT FLUX

Nelson D. Hochberg, P.O. Box 192, Flagstaff, Ariz. 86002

Filed Jul. 14, 1983, Ser. No. 513,702
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **4 Claims**





1. A solar radiant energy collector comprising:

A. an insulating cabinet defining an open cavity, comprising:

a. two surfaces spaced apart from one another, each of said surfaces forming a box-like receptacle defining a cavity, one of said surfaces being within the cavity formed by the other of said surfaces, said surfaces each having peripheral edges and being hermetically sealed to one another along said peripheral edges to form a chamber therebetween;

b. said chamber is evacuated; and

c. a supporting means disposed within said chamber to prevent said surfaces from collapsing into said chamber;

B. a light transmitting cover for closing an open end of said cabinet and admitting solar radiant energy into said cavity thereof, said light transmitting cover comprising:

a. two light transmitting surfaces parallel to each other and spaced apart from one another, said light transmitting surfaces each having peripheral edges and being hermetically sealed to one another along said peripheral edges of said light transmitting surfaces to form a chamber;

b. said chamber of said light transmitting cover is evacuated; and

c. a supporting means disposed within said chamber of said light transmitting cover, said supporting means preventing said light transmitting surfaces from collapsing into said evacuated chamber of said light transmitting cover;

C. a solar collector means enclosed within said cavity of said cabinet for absorbing solar radiant energy admitted through said light transmitting cover and converting said solar radiant energy to thermal energy; and

D. a heat removal means for removing thermal energy from within said cavity of said cabinet, said heat removal means being thermally coupled to said solar collector means.

4,531,512

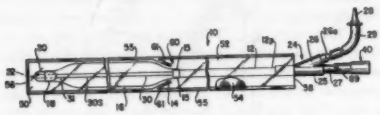
WRAPPING SYSTEM FOR INTRA-AORTIC BALLOON UTILIZING A WRAPPING ENVELOPE

Sidney Wolvek, Brooklyn, N.Y.; Bruce L. Hanson, Wayne, and John J. Lucas, Sparta, both of N.J., assignors to Datascope Corporation, Oakland, N.J.

Continuation of Ser. No. 273,407, Jun. 15, 1981, Pat. No. 4,444,186. This application Jan. 4, 1984, Ser. No. 567,964

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—1 D **24 Claims**



1. A wrapping system for an intra-aortic balloon comprising in combination:

(a) a balloon assembly including a hollow catheter and an elongated envelope, said envelope having its proximal end connected to the distal end of said catheter,

a member coupled to the distal end of said envelope and extending through it to support the envelope along its length,

means extending through the length of said envelope and being non-rotatably coupled to said distal end of said envelope for rotating said distal end, and

(b) restraining means separate from said balloon assembly for engaging a portion of the proximal end of said envelope adjacent said distal end of said catheter spaced therefrom which is not connected to said catheter for restraining said engaged portion of said envelope from rotating as the distal end is rotated to cause the wrapping of the envelope relative to said catheter to proceed from the distal end of the envelope toward its proximal end.

4,531,513

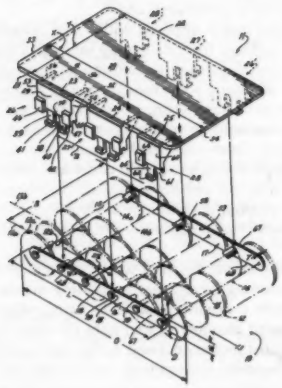
REMOVABLE HANDLE FOR A ROLLER MASSAGER

Joseph L. Liming, 3439 Franklin Rd., Felicity, Ohio 45120

Filed Nov. 18, 1983, Ser. No. 553,031

Int. Cl.³ A61H *15/00*

U.S. Cl. 128—57 **15 Claims**



9. A roller massager comprising

a series of rollers disposed in rows, said rows being located in a matrix configuration,

a frame connecting said rollers together one with the other to maintain said matrix configuration, and

a handle selectively connectable with and disconnectable from said roller matrix, said handle comprising

a base, and

at least one connector hingedly mounted to said base, said connector being movable between a storage plane and a use plane, said planes being at least 45° apart one from the other.

4,531,514

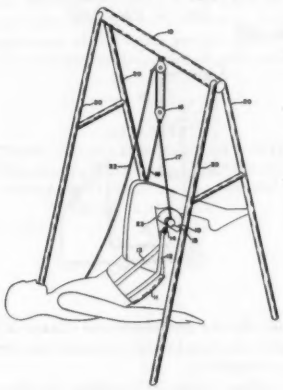
ORTHOPEDIC TRACTION APPARATUS

J. Ralph McDonald, 2156 Ridgewood Way, Bountiful, Utah 84010, and Philip S. McDonald, 565 6th Ave., Salt Lake City, Utah 84103

Filed Jun. 10, 1983, Ser. No. 503,249

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—75 **4 Claims**



1. Orthopedic traction apparatus comprising in combination:

a trapeze bar means for accomodating the legs of a user and having attachment means at either end thereof;

a traction pelvic belt means having suspending strap means extending upwardly from both respective sides of said belt means for attachment to said attachment means at the ends of said trapeze bar such that when in use said trapeze bar will be elevated above said suspending strap means;

block and tackle means attached to said trapeze bar means for hoisting said trapeze bar means, traction pelvic belt means and a user from a surface such that when in use said trapeze bar means will be elevated and positioned directly below said block and tackle means; and

means for suspending said block and tackle means from an elevated support means such that said block and tackle means and trapeze bar means will be at an elevated position above the torso of said user when in use allowing said user's legs, buttocks and pelvis to be raised by any desired position for traction and articulation of the spine.

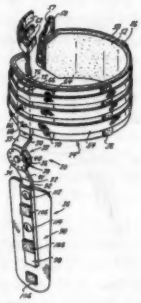
4,531,515
EXTERIOR ORTHOPEDIC ADJUSTABLE HINGE BRACE

Thomas A. Rolfes, 1943 Green Point Dr., Apt. No. 102, Kirkwood, Mo. 63122

Continuation of Ser. No. 522,600, Aug. 12, 1983, abandoned, which is a continuation of Ser. No. 472,921, Mar. 7, 1983, Pat. No. 4,481,941. This application May 23, 1984, Ser. No. 613,744

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—87 R **23 Claims**



1. An orthopedic limited range hinge brace for stabilizing a human bone joint on the exterior of the human body, in combination with supporting members affixed to the body about the joint, comprising:

(a) a first brace extension;

(b) a second brace extension;

(c) means for pivotally mounting the first brace extension to the second brace extension;

(d) means for selectively limiting the range of pivoting of the brace extensions relative to each other, said means being adjustable to limit pivoting over different ranges while maintaining pivotal engagement of the extensions to each other, and having means to be adjusted while the brace is mounted in use on the body, comprising at least one limiting member attachable to the first extension at a first location near the inner end of the first extension so that the limiting member blocks the second extension to restrict the second extension from pivoting farther in a first direction when the first and second extensions are at a first relative position to each other, with said limiting member being detachable from the said first location on the first extension and reattachable at a second location on the said first extension so that at said second location it restricts pivoting of the second extension in the first direction when the first and second extensions are at a second relative position to each other that is different from the said first relative position.

4,531,516
TRANSPARENT PRESSURE GARMENT

Forrest R. Poole, Worchester, and David G. Hansen, Sterling, both of Mass., assignors to David Clark Company Incorporated, Worcester, Mass.

Filed Feb. 7, 1983, Ser. No. 464,662

Int. Cl.³ A61F *5/04*; A61B *17/12*

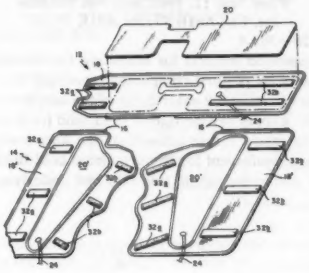
U.S. Cl. 128—89 R **7 Claims**

1. A transparent pressure garment comprising:

a flexible transparent exterior panel having a reinforcing mesh embedded therein, said mesh being an open scrim which permits a substantially unhindered view therethrough, said exterior panel having a pair of lower sections adapted to surround the legs of a wearer, and an upper section adapted to surround the abdomen of the wearer;

means for detachably connecting said lower sections to said upper section;

transparent inner panels sealingly secured at their peripheral edges to respective ones of said exterior panel sections in



a manner such as to define pressure chambers therebetween, the pliability of said inner panels being greater than that of said exterior panel; and means for introducing a pressurized gas into said pressure chambers to inflate the same.

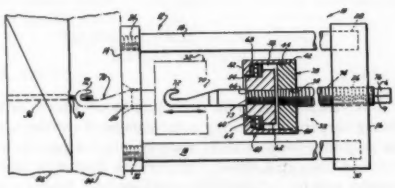
4,531,517
EXTRACTOR FOR INTRAMEDULLARY FASTENERS

Thomas E. Forte, 1500 Oak Knoll Dr., Cincinnati, Ohio 45244, and Ted K. Parr, 3069 W. Tower Ave., Cincinnati, Ohio 45238

Filed Mar. 24, 1983, Ser. No. 478,301

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 EC **9 Claims**



1. Apparatus for extracting a bone fastener from a bone of a patient comprising:

a support having an end adapted to engage the patient;

a threaded rod connected to said support, said threaded rod being axially movable relative to said support upon rotation of said threaded rod;

a carriage assembly connected to said threaded rod, said carriage assembly being rotatable and axially movable with said threaded rod toward and away from the patient;

an engaging element adapted to connect to said bone fastener; and

means for nonrotatably mounting said engaging element to said carriage assembly, said engaging element being movable axially with said carriage assembly and said threaded rod for extracting said bone fastener from the patient.

4,531,518

METHOD FOR INHIBITING THE DEVELOPEMENT OF BREAST BLISTERS ON POULTRY

Gary M. Johnson, Wallace, N.C., and Glen L. Heuberger, Clarendon Hill, Ill., assignors to Swift & Company, Oak Brook, Ill.

Filed Sep. 12, 1983, Ser. No. 531,066
Int. Cl.[3] A61B *17/36*; A01K *29/00*
U.S. Cl. 128—303.1 7 Claims

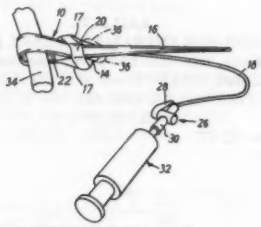
1. An approved method for inhibiting the development of breast blisters on poultry comprising: applying to a confined area of skin covering the anterior tip of the keel bone of young live poultry, a spray of a cryogenic cold fluid for a brief period sufficient to retard future growth of the keel bone tip, said period being insufficient for the cryogenic cold fluid to cause significant visible damage to said skin and underlying tissue.

4,531,519

VASCULAR CLAMP

David C. Dunn, 11 Trumpington Rd., Cambridge, CB2 2AJ, and David Scarrow, 6 Monmouth Paddock, North St. Philip, Somerset, both of England

Continuation of Ser. No. 512,021, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 311,390, Oct. 10, 1981, which is a continuation of Ser. No. 159,632, Jun. 16, 1980, abandoned. This application Jun. 18, 1984, Ser. No. 621,881
Claims priority, application United Kingdom, Jun. 21, 1979, 7921630
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—327 8 Claims



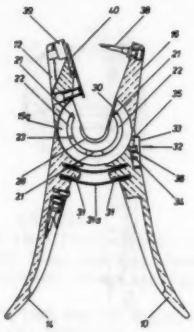
4. A vascular clamp for occluding blood vessels or the like during surgery, comprising a flat elongated envelope of flexible fluid-impermeable sheet material which tapers from a narrow end towards a broader end with a fluid inlet tube at the broader end for inflating the envelope, and having a strip of material extending transversely across the envelope at the broader end region and secured to the edges of the envelope to provide a slot between itself and the envelope through which the narrower end portion of the envelope can be threaded, a transverse seal being provided across the envelope intermediate its ends so that the narrower end portion is not inflated in use, the length of the uninflatable portion being greater than the length of the inflatable portion, the envelope being formed with a proximal lateral enlargement in the region of said transverse strip the envelope being formed from two superimposed layers of plastics film material peripherally sealed together, the peripheral seal between the layers following the outline of said proximal enlargement so that the internal width of the envelope is locally wider in the region, the transverse strip being welded at its ends to the envelope conicidentally with the peripheral seal.

4,531,520

APPLICATOR TOOL

Charles G. Reggers, 1 Maxwell Line; Lindsay W. J. Cohr, Aranui Rd., R.D. 5, and Stafford A. Y. Liddell, 129 Ruahine St., all of Palmerston North, New Zealand

Filed Jan. 6, 1983, Ser. No. 455,970
Claims priority, application New Zealand, Jan. 14, 1982, 199494; Nov. 4, 1982, 202390
Int. Cl.[3] A61B *17/00*
U.S. Cl. 128—330 16 Claims



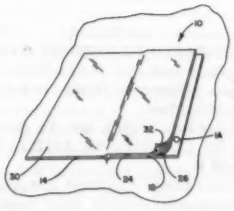
1. An animal ear tag applicator tool comprising a pair of levers coupled together by pivot means which extends through said levers such that said levers are pivotable about a pivot axis, the levers being formed to one side of the pivot axis as handles and to the other side of the pivot axis as jaws, said jaws when the applicator tool is in an open position being in a spaced apart opposed disposition defining therebetween a space, relative movement of said handles toward one another about said pivot axis causing relative movement of said jaws toward one another to a closed position wherein the jaws spaced apart but the space therebetween is reduced, and retaining means with each jaw for, in use of the applicator tool, retaining an animal ear tag part, characterized in that the pivot means includes an open recess extending through the jaws and within which recess the pivot axis is located, said recess being aligned with the space between the jaws in the open and closed positions thereof, as well as during relative movement of the jaws between said open and closed positions.

4,531,521

SKIN CLOSURE MEANS

Charles B. Haverstock, 44 Frederick La., Glendale, Mo. 63122

Filed Mar. 3, 1983, Ser. No. 471,718
Int. Cl.[3] A61B *17/08*
U.S. Cl. 128—335 15 Claims



1. A device for closing a skin separation comprising first and second sheet members each having opposite surfaces and means forming a side edge therealong, the means forming a side edge along the first sheet member for extending along one

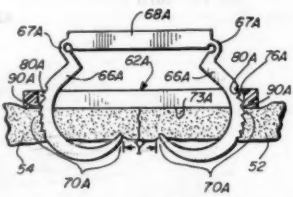
side of a skin separation to be closed and the means forming a side edge along the second sheet member for extending along the other side of the skin separation to be closed, said first sheet member having an adhesive on one of the opposite surfaces for attaching it to a skin surface with the side edge thereon extending along one side of the skin separation to be closed, said second sheet member having a flap portion attached thereto along the side edge thereof to form a continuation of the second sheet member, the said means forming the side edge of the second sheet member being formed by folding the flap portion back on the second sheet member to define a folded sheet edge therealong, said flap portion being movable relative to the second sheet member between the folded back position thereof in surface to surface contact with the second sheet member and a second position bridging the skin separation and movable into surface to surface contact with the first sheet member, means on one opposite surface of the second sheet member for adhesively attaching it to the skin with the folded side edge thereof extending along the other side of the skin separation to be closed, and means for attaching the flap portion to the first sheet member in the second position thereof.

4,531,522

TWO-PIECE TISSUE FASTENER WITH LOCKING TOP AND METHOD FOR APPLYING SAME

James J. Bedi, Stockton, N.J., and Madhusudan Joshi, E. Aurora, N.Y., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 20, 1983, Ser. No. 506,143
Int. Cl.³ A61B *17/08*
U.S. Cl. 128—335 **13 Claims**



1. A fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

a fastening member comprising a link member and a pair of spaced-apart legs hingedly connected to said link member, each said leg members being generally arcuate, said link member being adapted to be disposed on one side of at least one of said tissue portions, each said leg having a distal end portion adapted to be engaged with an oppositely facing side of one of said tissue portions opposite said link member, each said leg distal end portion terminating in a configuration adapted to penetrate said tissue portions; and

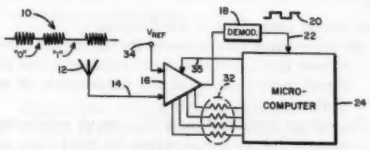
a retainer adapted to receive said fastening member legs, said retainer defining an engaging surface for engaging at least one of said tissue portions and defining means for engaging said fastening member legs whereby said fastening member may be applied to said tissue portions by penetrating said tissue portions with said legs so that said legs are spaced apart in said tissue portions by a first distance and whereby said retainer may thereafter be engaged with said fastening member legs to pivot said fastening member legs toward one another so that they are spaced apart by a second distance less than said first distance with at least part of each said leg distal end portion engaging one of said tissue portions and with said legs holding said tissue portions together while said retainer inhibits withdrawal of said fastening member.

4,531,523

DIGITAL GAIN CONTROL FOR THE RECEPTION OF TELEMETRY SIGNALS FROM IMPLANTED MEDICAL DEVICES

Katherine H. Anderson, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 4, 1984, Ser. No. 657,446
Int. Cl.³ A61N *1/00*
U.S. Cl. 128—419 PT **2 Claims**



1. A gain control system for verifying the programming of an implanted medical device wherein the programmed implanted device transmits telemetry confirmation signals to a programming means with a variable-gain receiving means after the programming of said implanted device, wherein said signals are encoded binary signals that comprise a plurality of bits; comprising:

means for establishing the response of said receiving means so that said response may be altered to eliminate noise when the signal level exceeds the noise level;

means for verifying that the encoded signals sent from said implanted device represent valid 1 and 0 data bits;

means for processing further information from said implanted device only if all of the bits of said encoded signals are verified as valid 1 and 0 data bits;

means for establishing a sampling period and for determining the number of error bits in said signals which are caused by noise and which do not correspond to correct data bits of said encoded signals during said period of time; and

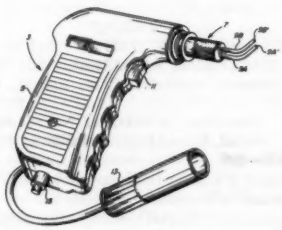
means for varying said response by a predetermined amount when the number of said error bits exceed a predetermined amount during one of said periods of time so that said response relative to a threshold level is altered.

4,531,524

CIRCUIT APPARATUS AND METHOD FOR ELECTROTHERMAL TREATMENT OF CANCER EYE

Paul Mioduski, Tucson, Ariz., assignor to RDM International, Inc., Phoenix, Ariz.

Filed Dec. 27, 1982, Ser. No. 453,811
Int. Cl.³ A61N *1/32*
U.S. Cl. 128—422 **17 Claims**



1. In an apparatus for electrothermal treatment of unhealthy tissue, a circuit for producing flow of a high frequency current through the unhealthy tissue to heat it without damaging adjacent healthy tissue, said electrothermal apparatus including first and second spaced current probes each having a contact surface for electrically contacting the surface of said unhealthy tissue to thereby conduct said high frequency electrical current

through said unhealthy tissue, said electrothermal treatment apparatus also including output oscillating circuit means for producing a high frequency voltage signal for application across said first and second current probes to cause said high frequency current to flow through said unhealthy tissue if said contact surfaces are held sufficiently forcefully against the surface of said tissue, said output oscillating circuit means including a control input for receiving a duty cycle signal for regulating the duty cycle of the flow of high frequency current.

said circuit comprising in combination:

(a) temperature sensing means for sensing the temperature of said first current probe to produce a first electrical signal representative of the temperature of said first probe;

(b) voltage controlled oscillating circuit means responsive to said first electrical signal for producing a second electrical signal, said second electrical signal being an AC signal, and continuously varying the frequency of said second electrical signal approximately proportionately to variations in the temperature of said first current probe, said voltage controlled oscillating circuit means including means for causing said second electrical signal to have a frequency that varies continuously between first and second predetermined audio frequencies as the temperature of said first current probe varies between first and second predetermined temperature levels;

(c) regulating circuit means for generating said duty cycle signal for application to said control input of said oscillating circuit means;

(d) delay circuit means for reducing the duty cycle of said duty cycle signal applied to said control input to a predetermined duty cycle for a predetermined initial time period after initial application of operating power to said circuit in order to prevent initial overheating of said unhealthy tissue due to thermal lag between heating of said unhealthy tissue by said high frequency current and heating of said first current probe;

(e) audio transducer means responsive to said second electrical signal for producing an audible sound, said audio transducer means including means for causing the pitch of said audible sound to represent the temperature of said first current probe and hence the temperature of said unhealthy tissue when said unhealthy tissue is being heated by said high frequency current,

whereby the user of said electrothermal treatment apparatus can immediately detect the reduction in the pitch of said audible sound caused by the user's failure to hold said contact surfaces adequately forcefully against said unhealthy tissue.

4,531,525

METHODS OF KNITTING BRASSIERE BLANK, MANUFACTURING BRASSIERE, AND PRODUCTS

Mark S. Richards, Apartment 1, 351 Elm St., Laconia, N.H. 03246

Filed Nov. 25, 1983, Ser. No. 554,935
Int. Cl.³ A41C *3/00*; D04B *7/04*
U.S. Cl. 128—489 **10 Claims**

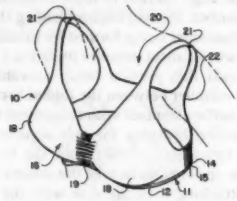
1. A method of making a circular knit blank for the manufacture of a brassiere comprising the steps of:

knitting a series of courses defining a first cylindrical tubular fabric portion in the form of a turned welt, and then

knitting to the first turned welt portion a series of courses defining a cylindrical tubular fabric frontal torso portion having a pair of breast cups defined by two areas in which the courses are simple knit with the areas being separated one from another by areas of gathered panels in which succeeding courses vary between simple knit and welt knit courses,

the knitting of courses defining the frontal torso portion differentially shaping the breast cups with respect to the gathered panels, and then

knitting to the frontal torso portion a series of courses defining a cylindrical tubular fabric strap and dorsal torso portion having an elongated area in which the courses are



simple knit with the area being divided by an elongated panel area in which succeeding courses vary between simple knit and welt knit courses, and then

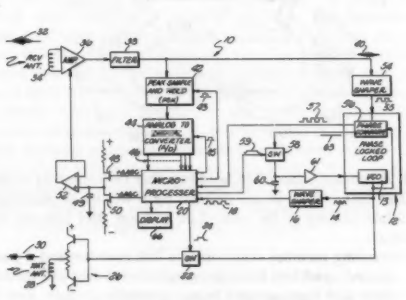
knitting to the strap and dorsal torso portion a series of courses defining a second cylindrical tubular fabric portion in the form of a turned welt.

4,531,526

REMOTE SENSOR TELEMETERING SYSTEM

Leonard J. Genest, 1061 Tropic La., Santa Ana, Calif. 92705

Continuation of Ser. No. 290,746, Aug. 7, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,376
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—630 **42 Claims**



1. A telemetering system for measuring a selected physical parameter of an object comprising:

an indicator device comprising:

an oscillator for generating an oscillating first signal,

means for intermittently transmitting a signal burst comprising a selected number of oscillations of the first signal,

means for receiving a second oscillating signal,

means for selecting one of the oscillations of the second signal occurring after the end of each signal burst,

means for measuring peak values for measuring the peak value of the selected one oscillation, and

means for displaying the measured peak value for indicating the value of the selected physical parameter; and

a passive but energy storing sensor circuit having associated therewith a variable figure-of-merit-of energy-storage (Q) for being excited by the transmitted excitation energy of the first signal to store a portion of the excitation energy and transmit a second signal having a parameter value dependent on the amount of excitation energy stored in the sensor circuit, the stored energy dissipating from the sensor circuit as a consequence of the transmission of the

transmitted second signal, the rate of stored energy dissipation being dependent on the value of Q, the sensor circuit comprising:

a first parallel tuned circuit having a resonant frequency for being rung by each signal burst from the indicator device, the tuned circuit transmitting the ringing to define the second signal, and

a selected parameter sensitive member coupled in the tuned circuit for altering the shape of the ring down and therefore the peak value of each oscillation of the second signal after the end of each signal burst, the parameter sensitive member being attached in parameter sensing relationship to the object.

4,531,527

AMBULATORY MONITORING SYSTEM WITH REAL TIME ANALYSIS AND TELEPHONE TRANSMISSION

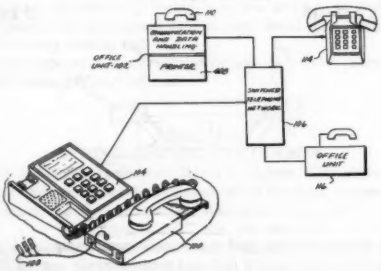
Herbert E. Reinhold, Jr., Rockville, Md., and Albert A. Auerbach, New York, N.Y., assignors to Survival Technology, Inc., Bethesda, Md.

PCT No. PCT/US82/00525, § 371 Date Jul. 9, 1982, § 102(e) Date Jul. 9, 1982, PCT Pub. No. WO83/03744, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 23, 1982, Ser. No. 403,775

Int. Cl.³ A61B 5/04

U.S. Cl. 128—696 **61 Claims**



1. A cardiac monitoring system for monitoring an ambulatory patient, comprising:

a cardiac monitoring patient unit for the ambulatory patient comprising:

means operatively connectable with a patient's body for providing an EKG signal indicative of electrical activity associated with a patient's heart action;

means for sampling the EKG signal provided by the EKG signal providing means to provide a plurality of EKG signal samples;

signal processing means for analyzing the EKG signal samples in real time and according to predetermined criteria and generating, as a result of that analysis, processed data including a plurality of cardiac events and statistics related to all heartbeats occurring during a predetermined monitoring period, for inclusion in at least a portion of corresponding patient report intelligible to a person skilled in coronary care;

memory means for storing the processed data generated by the signal processing means;

portable housing means, suitable for being worn or carried out by the patient, containing the sampling means, signal processing means and memory means;

patient actuable transmitting means for causing data including the processed data stored in the memory means to be read from the memory means and to be transmitted over a communication channel; and

office unit means for cooperative use with said patient unit, said office unit means having means for automatically and without the necessity of any human operator, receiving the processed data via the communication channel, means for automatically and without the necessity of any human operator comparing the processed data with predetermined medical personnel notification criteria, and means for automatically and without the necessity of any human operator notifying medical personnel if the predetermined medical personnel notification criteria is satisfied so that the medical personnel can intervene in an appropriate medical situation, said office unit means including means for preparing the corresponding patient report based upon the received processed data.

4,531,528

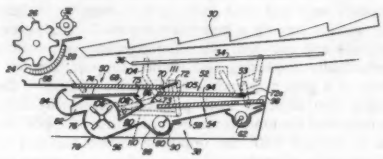
CLEANING SHOE FOR A COMBINE

Loren W. Peters, Bettendorf, Iowa, and Reed J. Turner, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 7, 1983, Ser. No. 472,506

Int. Cl.³ A01F 12/30

U.S. Cl. 130—24 **15 Claims**



13. A cleaning shoe for fore-and-aft disposition in a combine, having a chaffer screen for receiving threshed and separated material including chaff, tailings and grain and, disposed below it, a sieve screen and a clean grain conveyor disposed below and towards the upstream edges of the screens and a tailings conveyor disposed below and towards the rearward edges of the screens and a blower for directing an air blast rearwardly and upwardly towards the underside of the screens and means for agitating the screens so that chaff is carried rearwardly on the chaffer screen and tailings and grain pass through the chaffer screen onto the sieve screen, and tailings are carried rearwardly on the sieve screen for discharge at the rearward edge of the sieve screen and grain passes through the sieve screen to the clean grain conveyor characterized in that:

the sieve screen is associated with a chaffer screen extension, substantially coplanar with the sieve screen and having an upstream edge spaced downstream of the rearward edge of the sieve screen so as to define a transversely extending tailings slot spanning the sieve screen, for downward passage of the tailings and disposed so that tailings passing through said slot are delivered to the tailings conveyor.

4,531,529

PROCESS FOR INCREASING FILLING CAPACITY OF TOBACCO

Jackie L. White, Pfafftown, and Lucas J. Conrad, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 4, 1982, Ser. No. 432,476

Int. Cl.³ A24B 3/18

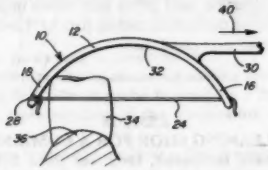
U.S. Cl. 131—291 **30 Claims**

7. A process for increasing the filling capacity of cut filler tobacco for cigarettes which comprises impregnating the tobacco with vapor of a low-boiling highly volatile inert expansion agent at supercritical conditions of pressure and temperature for said agent and thereafter reducing the pressure so as to cause the expansion agent to be expelled therefrom to expand the cellular structure of the tobacco by at least 50% and without subjecting the tobacco to additional heat.

4,531,530
DENTAL FLOSS HOLDER

Ormarion J. Aiken, Box 305, Sandpoint, Id. 83864

Filed Sep. 13, 1983, Ser. No. 531,735
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 2 Claims

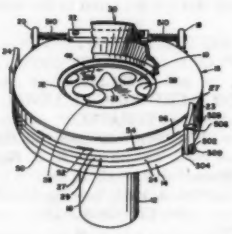


1. The method of effecting proper flossing of teeth comprising mounting an elongated section of dental floss between the free ends of an arched support member with said section in a tensioned state and with said support member including an inner surface having a generally horizontal midportion and oppositely and outwardly directed opposite end portions, and longitudinally displacing said arched support member transversely of a gum ridge while said section of floss is disposed between two adjacent teeth projecting upwardly from said gum ridge and the inner surface of said arched support member rides in contact with the opposing crown surfaces of said adjacent teeth, whereby said inner surface and crown surfaces of said adjacent teeth will coact as guide surfaces and laterally displace said arched support member and floss section toward and away from said gum ridge at a predetermined rate and through a predetermined lateral distance as said arched support member is displaced back and forth across said crown surfaces.

4,531,531
COIN HANDLING MACHINE

Roy B. Johnson, deceased, late of Manchester, Tenn. (by Wilma J. Johnson, legal representative), and Victor G. Ristvedt, Manchester, Tenn., assignors to Ristvedt-Johnson, Inc., Mt. Prospect, Ill.

Continuation-in-part of Ser. No. 207,963, Nov. 18, 1980, Pat. No. 4,444,212, which is a continuation-in-part of Ser. No. 921,063, Jun. 30, 1978, Pat. No. 4,234,003, which is a continuation of Ser. No. 735,060, Oct. 22, 1976, Pat. No. 4,098,280. This application Jun. 13, 1983, Ser. No. 503,530
Int. Cl.³ G07D *3/00*
U.S. Cl. 133—3 A 10 Claims



6. A coin sorter for sorting different denomination of coins comprising:

a rotatable member having a resilient surface;

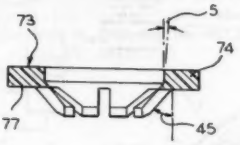
an annular shaped stationary member having a surface substantially parallel with said resilient surface and positioned sufficiently close to said resilient surface so that a portion of the stationary surface presses coins in contact therewith into the opposed resilient rotatable surface so that the resiliency of the rotatable surfaces urges the coins against the stationary surface with sufficient pressure to prevent radial movement of coins by centrifugal force due to rotation of the rotatable member, while permitting circumferential movement of the coins by rotation of the rotatable member;

selected areas of the surface of said stationary member being recessed for releasing any coins entering such recessed areas from the pressure of said resilient surface and thereby permitting radial movement of coins within the recessed areas by centrifugal force due to rotation of the rotatable member, said recessed areas being shaped to first guide coins outwardly in a single file along a predetermined path, and second to guide inwardly coins improperly aligned along said predetermined path, and third, to permit properly aligned coins of different sizes to escape radially from between of said surfaces by centrifugal force at different preselected positions along the periphery of said stationary member.

4,531,532
SNAP-ON VALVE GASKET

Robert D. Zimmerly, Kenosha, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Sep. 2, 1983, Ser. No. 529,102
Int. Cl.³ F16K *31/02*
U.S. Cl. 137—15 15 Claims



1. A valve stem and gasket assembly comprising:

(a) a valve stem having first and second axially spaced laterally extending peripheral shoulders for retaining a gasket therebetween; and

(b) said gasket having a plurality of resilient fingers adapted to pass over the first retaining shoulder when the fingers are in deflected condition to facilitate assembly and to engage the first retaining shoulder when the fingers are in a relaxed condition to prevent disassembly, the gasket interfitting and retained between said shoulders when the fingers are relaxed.

4,531,533
SEISMIC TRIGGER

Graham E. Coombes, 1201 St. Joseph Ave., Los Altos, Calif. 94022, and Austin J. Lemoine, 1020 Guinda St., Palo Alto, Calif. 94301

Filed Jan. 13, 1984, Ser. No. 570,575
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—46 9 Claims

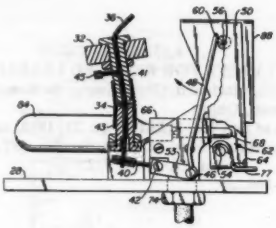
1. An apparatus responsive to inertial forces from a reference means for releasing an escapement comprising:

a weight; a coil extension spring attached to said weight; means for mounting said spring to said reference means such that said weight rests upon said spring, said weight being moveable in at least all directions in a plane transverse of the axis of said spring;

cable means attached to said weight, said cable means being reciprocally moveable in response to at least non-axial oscillatory movement of said weight;

escapement means, said escapement means comprising first lever means attached to said cable means, said first lever means being mounted on a pivot;

catch means, said catch means comprising a first stop means; a second lever means, said second lever means being operative to rest against said stop means in a first position, said first lever means being moveable between said first position and a second position; third lever means mounted to a base pivot means, said third lever means including a second stop means at a position extended from said base pivot means for encountering said second lever means closely adjacent to the pivot of said second lever means



for obtaining a mechanical advantage with respect to the end of said second lever means when said second lever means is resting against said first stop means, said third lever means being biased to urge such second lever means against said first stop means; wherein said second position releases for movement said second lever arm from said first stop means; and

means responsive to movement of said third lever means for releasing pressurized gas.

4,531,534

SPRING-POWERED ACTUATOR

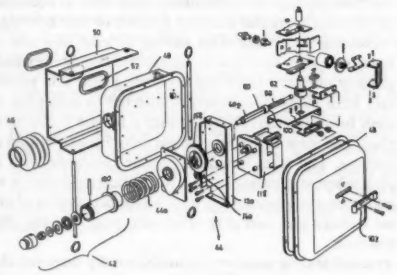
Robert J. Magill, Tankerton; David J. Gaiger, Kingsdown, and Neil Simkins, Ashby-de-la-Zouch, all of England, assignors to Actionair Equipment Limited, Whitstable, England

Filed Nov. 9, 1982, Ser. No. 440,309

Claims priority, application United Kingdom, Nov. 10, 1981, 8133852; May 26, 1982, 8215444

Int. Cl.³ E05F *15/20*

U.S. Cl. 137—75 **19 Claims**



1. A spring-powered actuator for operating at least one component which is movable between at least two positions said actuator comprising component-actuating means adapted to be connected to said component so as to move the latter, spring means acting on said component-actuating means as a source of power to urge said component-actuating means into a component-moving position, a screw-threaded longitudinally displaceable re-wind screw mounted for rotation to re-charge said spring means after said spring means have been used to power movement of said component, a tilting element mounted for tilting movement with respect to said re-wind screw, at least one projecting member on said tilting element arranged to engage said screw-thread of said re-wind screw to hold said screw against longitudinal displacement, and release means for releasing said tilting element whereby said projecting member thereon is disengaged from the screw-thread of said re-wind screw as said tilting element tilts, thereby allowing the re-wind screw to be displaced longitudinally under the power of said spring means to effect movement of said component.

4,531,535

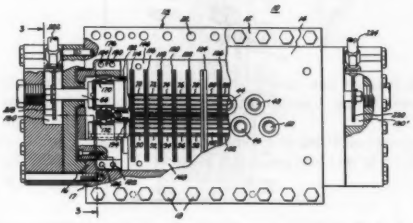
FLOW DIVIDER

James G. Kiernan, Albany; Robert J. Liddell, Ballston Spa, and Ronald T. Henke, Schenectady, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,665

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—99 **11 Claims**



1. In an improved flow divider having first and second rotatable shafts carrying respective metering gears of a plurality of sets of metering gears, a main housing body for enclosing said shafts and metering gears, a common fluid inlet connected to one side of each of said gear sets and an individual fluid outlet connected to the other side of each respective one of said gear sets, roller bearings connected to and supporting each end of each of said gear shafts, a source of lubricating oil for lubricating each of said roller bearings, and means for isolating said source of lubricating oil from the fluid metered by each of said metering gears, the improvement comprising:

first and second continuous gear shafts, each shaft carrying a plurality of spaced metering gears, the metering gears on each shaft mating with corresponding gears on the other shaft and forming mating gear sets;

all of the metering gears of one shaft and at least one of the metering gears of the second shaft being affixed to their respective shaft while permitting movement of said gears in the axial direction of said shafts;

a plurality of partitions, each having top, bottom and opposed end edge portions, axially positioned between adjacent gear sets and in substantially fluid sealing arrangement with said shafts;

first and second partition retainers, each of said retainers having a plurality of spaced slots to receive an end edge portion of each of the partitions in a fixed relationship to the axial direction of the shafts;

a housing upper half having a plurality of spaced slots in the interior thereof to receive a part of the top edge portion of a partition;

said housing upper half and said partition retainers defining a metering compartment for each of said metering gear sets;

a housing lower half adapted to receive said upper half, said metering compartments, and having interior walls spaced from the lower edge portion of said partitions and said metering gear sets to form a common reservoir for said plurality of metering compartments;

walls defining an inlet passage extending entirely through said lower half to said common reservoir, and walls defin-

ing an outlet passage extending through said upper half for each of said metering compartments.

4,531,536

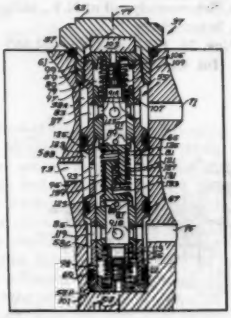
FLOW DIVIDER-COMBINER VALVE

Constantine Kosarzecki, Inverness, Ill., assignor to Modular Controls Corporation, Villa Park, Ill.

Continuation of Ser. No. 404,131, Aug. 2, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 647,915

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—111 **6 Claims**



1. A flow divider-combiner valve unit comprising: a cavity having first and second spaced portions and a cavity portion intermediate said first and second cavity portions; first and second passageways communicating with said first and second cavity portions and a third passageway communicating with said intermediate cavity portion of; first and second pressure-responsive elements individually movable in said cavity respectively between open positions and progressively closed positions thereby for controlling fluid flow between said first and second cavity portions and said first and second passageways, said first and second elements respectively including fourth and fifth passageways providing communication between said first and second passageways and said cavity, said fourth passageway being alignable with one of said first and second passageways and said fifth passageway being alignable with the other of said first and second passageways for thereby providing said open positions for enabling substantially unrestricted flow individually through said one and through said other of said first and second passageways; means disposed within said cavity and cooperatively engagable with said first and second elements in a first predetermined inner position fixed against further movement inwardly of the cavity for individually retaining said first and second elements substantially in said open positions until there is at least a predetermined substantial pressure difference between fluid pressures in said first and said second cavity portions and said intermediate cavity portion and; means disposed within said cavity and coactable with said retaining means permitting movement of said retaining means from the said inner position outwardly of the cavity under influence of the adjacent pressure-responsive element for enabling said first and second elements to move substantially independently of each other toward said respective closed positions when a predetermined pressure differential between said intermediate cavity portion and one of said first and second cavity portions exceeds said predetermined pressure difference and for causing said first and second elements to move substantially in unison when the pressure differential between said intermediate cavity portion and both of said first and second cavity portions exceeds said predetermined pressure difference, said retaining means including helical spring means acting against one end of a sleeve member selectively engaging and disengaging the adjacent pressure-responsive element, and a fixed abutment member interiorly telescopingly cooperating with the opposite end of the sleeve member for limiting movement thereof beyond the said predetermined inner position thereof.

4,531,537

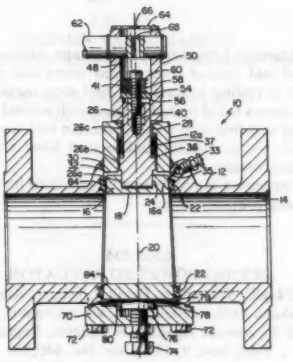
PLUG VALVE FOR REDUCED LEAKAGE

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Continuation of Ser. No. 142,611, Apr. 21, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,416

Int. Cl.³ F16K *5/22*

U.S. Cl. 137—246.22 **15 Claims**



1. A plug valve comprising:

a valve housing having a flow passage therethrough;

a valve plug rotatably fitted within said valve housing across the flow passage for controlling fluid flow in accordance to the plug's angular position relative to said housing;

an actuating stem, said stem having at least two side portions, said stem having a shoulder, said shoulder extending radially outward from and separating said side portions, said stem being operatively connected to said plug, said stem being operatively fitted into a female recess in said plug, said stem being at least partially housed within said housing, said stem having a greater clearance with said plug when said passageway is not in correspondence with said bore; said clearance providing for prevention of internal leakage past said plug when said plug is in the closed position;

an external sealing member circumferentially disposed about the stem proximal to an axially adjacent section with respect to the shoulder on the opposite side thereof with respect to the valve plug;

a first chamber at least partially defined by the end of the plug interacting with the stem, the valve housing and the side of the stem shoulder opposite the external sealing member;

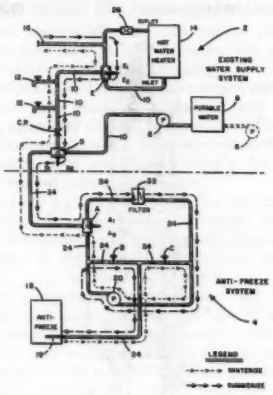
means for controlling the pressure of said fluid irrespective of the fluid pressure in said flow passage;

means for permitting axial movement of the stem in response to fluid pressure in said first chamber to compressingly and sealingly interact the shoulder and the external sealing member.

4,531,538
WATER SUPPLY WINTERIZING SYSTEM

David K. Sandt, 316 Cedar La., Montevideo, Minn. 56265; Arthur V. Mitlyng, Jr., Rte. 2, Box 120, Boyd, Minn. 56218; Harold W. Ilaug, Box 468, 816 Town Rd., and Robert D. Quenemoen, Rte. 5, both of Montevideo, Minn. 56265

Filed Jan. 6, 1984, Ser. No. 568,823
Int. Cl.³ E03B 5/00; F16K 37/00
U.S. Cl. 137—334 6 Claims



1. Apparatus for filling and removing anti-freeze from the water supply conduits of a water supply system having a dedicated pump, comprising in combination:

(a) an anti-freeze containing reservoir;

(b) a second pump;

(c) a first three-way valve coupled in fluid flow relation to said water supply conduits and said anti-freeze reservoir for bypassing a water source and coupling anti-freeze to said water supply conduits in a first position and bypassing said anti-freeze and permitting the flow of water in said water supply conduits in a second position;

(d) a second three-way valve coupled to a hot water suppluy conduit and an inlet and outlet port to a hot water heater for bypassing said hot water heater in a first position and for directing water flow through said water heater in a second position; and

(e) a closed-loop fluid flow means coupled in fluid flow relation to said second pump and between said anti-freeze containing reservoir and an anti-freeze supply side of said first three-way valve for supplying anti-freeze to said water supply system in a winterizing mode, or for recoverably pumping said anti-freeze from said water supply system and returning it to said reservoir in a summerizing mode, when said first and second three-way valves are in said first position.

4,531,539
CONTROL VALVE FOR FLOW OF SOLIDS

Frank J. Jandrasi, and Eric P. Ringle, both of Houston, Tex., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 324,175, Nov. 23, 1981, abandoned.
This application Aug. 10, 1984, Ser. No. 639,607
Int. Cl.³ F16K 3/00
U.S. Cl. 137—375 12 Claims

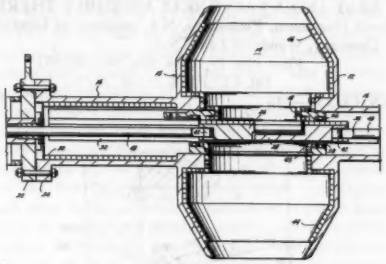
1. A flow control valve comprising,

a body provided with a flow passage therethrough,

an orifice plate removably secured in the flow passage,

a pair of slides disposed adjacent to and downstream of the orifice plate and relatively moveable toward and away from one another to a closed position and to an open position, respectively, operable to close and open the flow passage,

a flow control port in one of the slides permitting flow therethrough positioned to be closed when the slides are in the closed position and to be progressively opened as the slides are moved away relative to one another, and



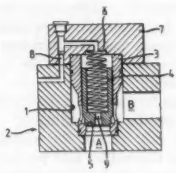
guides in the body, and interfitting groves and tongues in and on the guides and the slides disposed out of flow through the flow passage,

there being a space between the guides at the flow passage whereby closing of the slides clears any build up of solids in the guides.

4,531,540
SERVOCONTROLLED PRESSURE LIMITING VALVE

Erwin Meister, deceased, late of Oensingen, Switzerland (by Margrith Meister-Beck, heir), assignor to Von Roll Hydraulik AG, Oensingen, Switzerland

Filed May 13, 1983, Ser. No. 494,319
Claims priority, application Switzerland, May 19, 1982, 3131/82
Int. Cl.³ F16K 31/36
U.S. Cl. 137—492.5 8 Claims



1. A servocontrolled pressure limiting valve for controlling pressure in two pressure lines, comprising:

a housing having first and second connections selectively forming drain and inlet ports;

a main valve piston mounted in said housing and having opposite first and second ends, said first end including a first end face in fluid communication with said first connection, said valve piston having a first annular face between said ends connected by a line to said second connection;

an annular piston fixed on said second end of said valve piston, said annular piston including a second annular face opposite to said first annular face;

an annular cylinder space in said housing adjacent said second end of said valve piston, said cylinder space defined on one side by said second annular face;

a pilot-operated valve in fluid communication with said cylinder space;

fluid circuit means, coupled to said housing, for alternatively connecting said first and second connections to said cylinder space in fluid communication, said fluid circuit means

including a shuttle valve connected by lines to said first and second connections; and

an inner space in said valve piston vented to relatively low pressure.

4,531,541

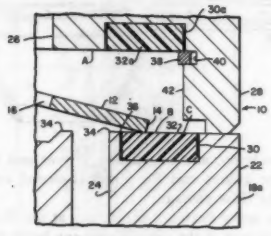
PLATE-TYPE VALVE, AND AN IMPROVED VALVE SEAT AND A VALVE SEAT ASSEMBLY THEREFOR

Kevin Hartshorn, Plainsboro, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 16, 1984, Ser. No. 580,831

Int. Cl.³ F16K *21/04, 21/10*

U.S. Cl. 137—514 **8 Claims**



1. A plate-type valve, comprising:

first means defining a valve seat; and

second means defining a valve guard fixed in spaced-apart relation to the valve seat; wherein

one of said first and second means has means defining a flat bearing surface for receiving valving means thereon;

said seat and guard have openings formed therethrough to accommodate a fluid flow therethrough; and further including

valving means, interposed between said seat and guard, and independently movable therebetween (a) to accommodate removal of said valving means from said bearing surface, and to permit impacting closure of said valving means onto said bearing surface, and (b) for occluding and exposing given ones of said openings to inhibit, and to permit, fluid flow therethrough, respectively; wherein

said valving means has an outermost periperal edge;

said bearing surface encompasses a given area and has a given perimeter;

said one means further has a recess formed about said given perimeter; and further including

means set in said recess for impacting, point-contacting engagement thereof by said peripheral edge of said valving means upon the latter closing upon said bearing surface at an angle relative thereto, thereby to dissipate impacting forces of said valving means.

4,531,542

FLUID DAMPENED BACK PRESSURE REGULATOR

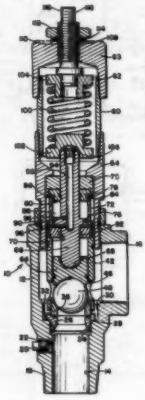
Raymond H. Looney, Tulsa, Okla., assignor to Baird Manufacturing Company, Tulsa, Okla.

Filed Aug. 22, 1983, Ser. No. 525,400

Int. Cl.³ F16K *47/00, 15/06*

U.S. Cl. 137—514.7 **3 Claims**

1. A fluid dampened back pressure regulator valve comprising housing means having inlet port means and outlet port means in communication with the inlet port means, valve seat means disposed within the housing and interposed between the inlet port means and outlet port means, cage means engageable with the valve seat means for retaining the valve seat in the housing means, valve closure means loosely disposed within the cage means and cooperating with the valve seat means to provide alternate open and closed positions for the back pressure regulator valve, reciprocal piston means disposed within the cage means and engageable with the valve closure means, spring means disposed within the housing means and in engagement with the reciprocal piston means for retaining the piston means in engagement with the closure means and maintaining a normally closed position for the back pressure regulator valve, fluid reservoir means cooperating with the reciprocal piston means for dampening the opening and closing of the valve closure means with respect to the valve seat means for reducing the clattering of the back pressure valve during operation thereof, wherein the reciprocal piston means comprises shock cage means disposed within the housing means and having one closed end engageable with the cage means and one



open end, a reciprocal piston rod member extending through the shock cage means and through the closed end thereof, shock cap means secured to the open end of the shock cage means to provide a fluid reservoir chamber therein, a piston member carried by the piston rod member and reciprocally disposed within the fluid chamber, and passageway means provided in the piston rod member in communication with the fluid reservoir chamber on opposite sides of the piston member for cooperating with the fluid reservoir to provide the dampening during the opening and closing of the back pressure regulator valve.

4,531,543

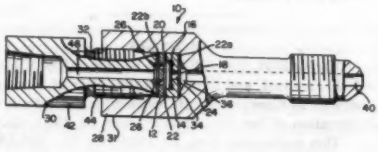
UNI-DIRECTIONAL FLOW, FLUID VALVE

George L. Markley, Montour Falls, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 506,017, Jun. 20, 1983, abandoned. This application Nov. 15, 1984, Ser. No. 671,811

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—515.7 **8 Claims**



1. A uni-directional flow, fluid valve, comprising:

first means defining a circular valve seat;

second means defining a circular valve plate;

an annular seal; and

third means holding said seat and said plate in a mutually confronting relationship with said seal therebetween in

interfacing and sealing engagement with both said valve seat and said valve plate; wherein

said seat and said plate have means which, with said seal, cooperatively define a cylindrical, fluid-sealed chamber therebetween; and

a circular valving element having a given outside diameter, confined in said chamber, and freely and wholly movable between first and second spaced apart positionings therewithin; wherein

said valving element is formed of metal, and is very thin, lightweight, and supple;

said seat, plate and said element are orificed to accommodate fluid flow, sequentially, through one of said first and second means, through said element, and through the other of said first and second means;

said seat, plate and said element have means cooperative (a) to prohibit such aforesaid sequential fluid flow therethrough, upon said element being in one of said first and second positionings, and (b) to permit such fluid flow therethrough, upon said element being in the other of said first and second positionings; and

said element and a given one of said first and second means have orifices formed therein, as aforesaid, which are always in substantially common, coaxial alignment or registry, always to accommodate fluid flow therebetween; wherein

said element comprises means responsive only to fluid pressure addressed thereto (a) through one of said first and second means, for moving said element, wholly, from one of said first and second positionings to the other thereof, and (b) through the other of said first and second means, for moving said element, wholly, from the other of said first and second positionings to said one positioning;

the other of said first and second means has orifices formed therein, as aforesaid, which are always out of registry with any orifice in said element;

said valve plate has a circumferential wall which, with said seal and said seat defines said fluid-sealed chamber, and has an inside diameter which is approximately ten percent greater than said given outside diameter of said valving element to accommodate said valving element nestably therewithin; and

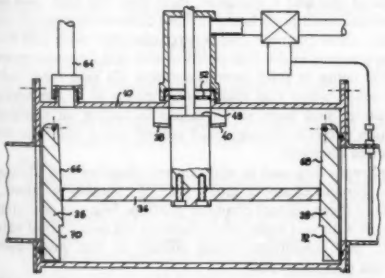
said orifice in said given means is (a) substantially smaller in diameter than said given outside diameter of said valving element, and (b) larger in diameter than said orifice in said element.

4,531,544

FIRE FLAP ARRANGEMENT

Franz Jacobs, Alte Bahn 86, D-Bedburg-Hau 1, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,533
Int. Cl.³ F16K *1/18*
U.S. Cl. 137—614.11 **6 Claims**



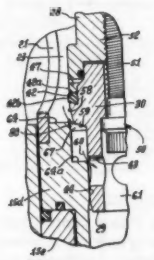
1. A fire flap arrangement for closing a flow channel comprising a housing for insertion into the flow channel, the housing consisting of a peripheral wall and a pair of opposed front walls, each front wall provided with an opening, said pair of openings being coaxially arranged, a flow area being defined within said housing between said pair of openings, a pair of fire flaps within said housing, each of them having inside and outside surfaces and being pivotably mounted adjacent to one of said pair of front walls, said pair of fire flaps in the open position thereof being held substantially parallel with one another and with the axis of the housing, and in the closed position thereof having said outside surfaces held in contact with said pair of front walls, securely closing said pair of openings, locking means movably arranged within said housing between a rest position outside of the flow area of the housing and a locking position between said pair of fire flaps in the closed position thereof, said locking means having axially opposite ends contacting the inside surfaces of the fire flaps as said locking means moves to its locking position; the inside surfaces of the fire flaps being inclined ramps converging toward each other in the direction of movement of the locking means toward its said locking position, whereby the ends of the locking means increasingly press the fire flaps outwardly against said pair of front walls respectively as said locking means moves to its locking position, and driving means for moving the locking means into the locking position thereof comprising a liquid pressure piston cylinder arrangement actuated by a liquid supplied by a liquid supply system; connected with said housing and communicating with the interior thereof when the locking means has moved to its locking position for filling the housing with said liquid, and a liquid outlet pipe connected with the housing for creating a liquid flow through the housing to effect cooling thereof.

4,531,545

DRILLING CHOKE VALVE

John D. Muchow, Long Beach, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Apr. 4, 1983, Ser. No. 481,739
Int. Cl.³ F16K *47/04*
U.S. Cl. 137—625.39 **8 Claims**



1. In a multiposition choke valve assembly, the combination comprising

(a) a valve body defining an interior chamber and inlet and outlet flow ports communicable with that chamber,

(b) a valve stopper sub-assembly movable axially longitudinally in the chamber, the sub-assembly including an axially extending stem, an axially extending sleeve, an annular section located between the stem and sleeve, and an annular seal on said annular section and exposed at the section periphery,

(c) the sleeve forming multiple through openings and having a retracted position in which the flow passes with relatively lesser velocity past the seal and then forwardly to pass via said openings with relatively increased velocity into the sleeve, followed by generally axially forward flow toward the outlet flow port,

(d) the sleeve having an advanced position in which the seal

is radially compressed to engage a body bore wherein the seal is entirely received, and said flow through said sleeve openings is blocked,

(e) said annular section comprising a flange, the seal being non-metallic and having an outer surface the diameter of which is greater than the outer diameter of said sleeve at said sleeve openings,

(f) the flange projecting between the seal and sleeve and having an annular taper extending toward the sleeve to provide a gap with the body that controllably passes the fluid flow, which subsequently acelerates as it flows through said openings, the gap width being smaller than the widths of said openings and the gap area being grater than the flow passing areas of said openings,

(g) wherein said body outlet flow port is axially spaced from the sleeve, and said body inlet flow port is located at a side of the body to direct the inlet flow toward the sleeve and said gap in retracted position of the sleeve,

(h) said flange and sleeve consisting of wear resistant material, and said sub-assembly including an actuator movable to compress the seal axially, and located to retain the seal in position on the flange,

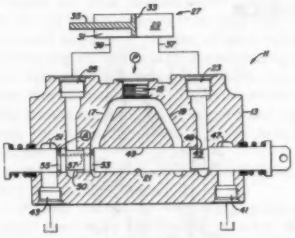
(i) the actuator and sleeve having a lost motion connection so that the sleeve has limited movement relative to the flange for compressing the seal axially only after the seal and flange taper are fully received in said bore.

4,531,546

CONTROL SPOOL VALVE

Michael E. Barr, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 486,758, Apr. 20, 1983, abandoned.
This application Feb. 5, 1985, Ser. No. 698,266
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—625.69 **2 Claims**



1. In combination with a control valve having a housing defining an elongated cylindrical chamber, a pressure inlet port intersecting said chamber, a tank port intersecting said chamber and axially removed from said pressure inlet port, a work port intersecting said chamber and located axially between said pressure inlet port and said tank port, a valve spool slidably mounted axially within said chamber, said valve spool having a recess axially located between a first and second axial landing, said valve spool being slidably positionable such that in a first position fluid communication is derived from said pressure inlet port around said recess to said work port fluid communication to said tank port being blocked by said first landing, in a second position fluid communication from said work port to said inlet port is blocked by said second landing and to said tank port is blocked by said first landing and in a third position fluid communication is derived between said work port and said tank port around said recess and communication to said inlet port is blocked by said second landing, wherein the improvement comprises:

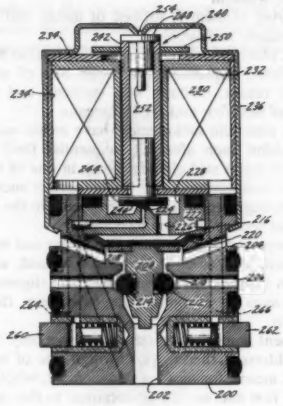
sealing means for providing a high pressure wet seal between said work port and said tank port when said valve spool is in said second position.

4,531,547

MINIATURIZED VALVE

Edward H. Hadden, 12 Laurel Dr., Granby, Conn. 06035

Filed Jan. 17, 1983, Ser. No. 458,633
Int. Cl.³ F15B *13/043, 13/042*
U.S. Cl. 137—625.64 **7 Claims**



1. A flow controller comprising:

housing means, said housing means defining a plurality of ports accessible from the housing means exterior and a main valve chamber, said housing means also defining a first passage terminating in said main valve chamber and connecting a first of said ports to the main valve chamber, said housing means further defining a second passage terminating in said main valve chamber and connecting a second of said ports to the main valve chamber at a point displaced from the termination of said first passage, a first valve seat being disposed in said main valve chamber between the termination of said first and second passages, said housing means additionally defining a control chamber which communicates with said main valve chamber via a second valve seat, said housing means also defining a third passage connecting a third of said ports to said control chamber, said housing means further defining a third valve seat;

freely movable main valve means in part positioned in said housing means main valve chamber, said valve means being translated solely in response to applied fluidic pressure between a first position where it establishes a seal with said first seat and is displaced from said second seat and a second position where it establishes a seal with said second seat and is displaced from said first seat, said second and third ports being in fluid communication via said main valve chamber and control chamber with said main valve means in the first position and said first and second ports being in fluid communication via said main valve chamber when said main valve means is in the second position, said main valve means including an extension which projects through said second valve seat into said control chamber;

a diaphragm disposed in said control chamber and dividing said control chamber into a pair of chamber portions, a first of these control chamber portions being in communication with said main valve chamber via said second valve seat, said diaphragm being affixed to said main valve means extension; and

means for selectively delivering a pressurized fluid to the second portion of said control chamber and for venting pressurized fluid from said second control chamber portion to cause the translation of said main valve means, said delivering and venting means comprising:

means defining a second valve chamber, said second valve chamber being in fluid communication with said control chamber;

pilot valve means, said pilot valve means having a movable valve member disposed in said second valve chamber;

means for supplying pressurized fluid to said second valve chamber, said supplying means including a fourth valve seat which cooperates with said pilot valve means valve member in the closed condition of said pilot valve means;

vent valve means having a movable valve member which cooperates with said third valve seat;

means defining a vent passage which provides fluid communication between said second valve chamber and said third valve seat; and

solenoid means including a selectively energizable coil defining a central opening which extends between opposite sides of said coil and elongated plunger means, said plunger means being in part disposed in said central opening and being reiprocal between first and second positions, said plunger means extending from the said opposite sides of said coil and being at least in part comprised of magnetic material, said plunger means being connected at a first end thereof to said vent valve means movable valve member, the second end of said plunger means extending into said second valve chamber and being connected to said pilot valve means movable valve member whereby said vent valve means and pilot valve means may be operated simultaneously and in the opposite sense, the opening of said pilot valve means being commensurate with the closing of said vent valve means and the pressurization of said second control chamber portion, pressurization of said second control chamber portion causing movement of said main valve member to the said first position thereof in response to movement of said diaphragm, the closing of said pilot valve means causing the opening of said vent valve means and the venting of pressurized fluid from said control chamber second portion thereby permitting said main valve means to move from the said first position thereof to the second position thereof in response to the pressure in said main valve chamber, said plunger means being caused to reciprocate in a first direction in response to the controllable application of energy to said coil, said plunger means being caused to reciprocate in the opposite direction solely in response to pressurized fluid in said second valve chamber.

4,531,548

APPARATUS TO VARY THE FORCE EXERTED ON AN ACTUATOR MECHANISM

Helmut Gottling, Isernhagen, and Walter Brausfeld, Hanover, both of Fed. Rep. of Germany, assignors to WABCO Steuerungstechnik GmbH, Hannover, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,572

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244920

Int. Cl.³ F15B *13/16, 13/044*

U.S. Cl. 137—627.5 **15 Claims**

1. A force transmitting fluid actuator for operating a control device, said force transmitting fluid actuator comprising:

(a) a housing having an actuator portion formed therein;

(b) an actuator member movable within said actuator portion;

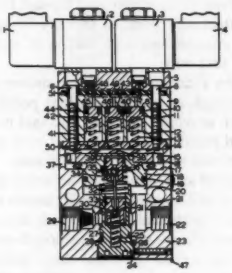
(c) a plurality of pressure chambers formed in said housing adjacent said actuator portion and symmetrically-arranged about the vertical axis of said housing;

(d) a plurality of pistons movable within said plurality of pressure chambers such that a piston force is transmitted to a first side of said actuator upon movement of at least one of said plurality of pistons, said actuator is urged in a first direction corresponding to actuation of the control device;

(e) pressure supply means for selectively pressurizing said at least one of said plurality of pistons wherein such piston force is applied to said actuator in a balanced manner about said vertical axis;

(f) valving means for connecting said pressure supply means to said plurality of pressure chambers such that, said pressure supply means selectively pressurizes said plurality of pressure chambers in unitary increments; and

(g) piston limiting means disposed between said plurality of pistons and said actuator member for limiting at least one



of said plurality of pistons to a predetermined displacement independent of variations in the force exerted by said pressure supply means, said piston limiting means including a plurality of piston springs approximately corresponding in number to said plurality of pistons, said plurality of piston springs being disposed such that, at least a portion of such piston force is transmitted therethrough as a function of a preselected spring constant variable according to a selection of spring constants for each of said plurality of piston springs.

4,531,549

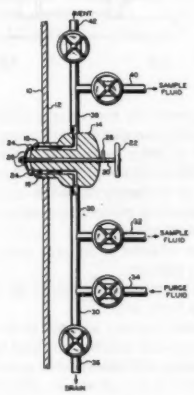
VALVE MEANS AND FLUID TRANSPORT SYSTEM

Delouis J. Fontenot, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1982, Ser. No. 449,934

Int. Cl.³ F16K *3/22*

U.S. Cl. 137—864 **13 Claims**



1. A valve means comprising:

(a) a valve body;

(b) a rotatable, straight, two-ended stem passing through said valve body and having a length sufficient to extend beyond both ends of said valve body;

(c) rotation means mounted on a first, operating end of said stem and adapted to rotate said stem;

(d) said valve body having at least one elongated, unobstructed passage therethrough, one end of said passage being generally parallel to and offset from said stem and terminating in a circular port in the end of said body adjacent the second, operable end of said stem;

(e) a radially-disposed arm having one end connected to said second, operable end of said stem to rotate therewith and the free end thereof extending to a point adjacent said port; and

(f) a ball-type closure mounted on said free end of said arm, larger than said port, to thereby fit against said port in sealing engagement with said port, and resiliently urged toward said port;

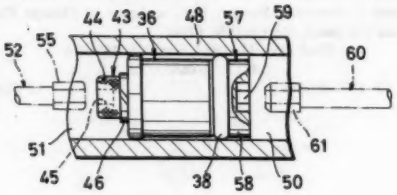
(g) whereby rotation of said stem moves said ball-type closure through an arc from a first position removed from said port, at which said port and said passage are open, to a second position in engagement with said port, at which said port and said passage are closed;

(h) said end of said valve body adjacent said second, operable end of said stem has formed therein an arcuate channel coincident with said arcuate path traveled by said ball-type closure from said first position to said second position and having a cross-sectional shape generally conforming to the shape of said ball-type closure, whereby said channel guides said ball-type closure from said first position to said second position.

4,531,550
PLUG FOR USE IN THERMAL-MEDIUM PASSAGES IN AIR CONDITIONING SYSTEMS

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,176
Claims priority, application Japan, Jul. 21, 1982, 57-110378
Int. Cl.³ F16L *55/09, 55/12*
U.S. Cl. 138—89 **5 Claims**



3. A plug assembly for use in a fluid passage, comprising:

(a) an imperforate gasket seat having a contour substantially equal to an inner peripheral surface of the fluid passage;

(b) a central cylinder projecting from said gasket seat and having an internally threaded hole;

(c) an elastomeric gasket disposed on said gasket seat around said central cylinder;

(d) a sleeve adapted to fit over said central cylinder within the fluid passage;

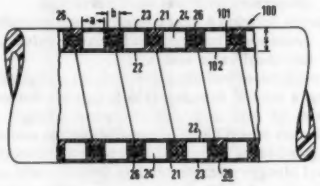
(e) an end member attached to an end of said sleeve and having a hole; and

(f) a threaded fastener adapted to be threaded through said hole in said end member into said internally threaded hole for pressing said elastomeric gasket axially between said gasket seat and said sleeve and resiliently radially outwardly against the inner peripheral surface of the fluid passage, said fastener comprising a socket head cap screw including a head having a first socket, said gasket seat having a second socket defined therein and opening away from said first socket, the socket of said cap screw and said gasket seat being hexagonal.

4,531,551
DOUBLE-WALLED, FLEXIBLE HOSE

Leo Eichelberger, Ruesselsheim, and Hans-Joachim Ciszewski, Einhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,769
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246247
Int. Cl.³ F16L *9/16*
U.S. Cl. 138—129 **18 Claims**



1. In a hose having an inside wall surface spaced from an outside wall surface to provide a flexible double wall hose with a helical reinforcement with axial spacing between the turns being positioned in a cavity between the walls, the improvement comprising the hose being constructed of a helically extending member having a cross-sectional profile containing a center part with an inside surface extending parallel to an outside surface, the center part having a thickness between said inside and outside surfaces corresponding to the thickness of the double wall of the hose, said outside surface having a first extension and the inside surface having a second extension, said first and second extensions proceeding in opposite directions from the center part and forming extended surfaces for the inside and outside surfaces, said member being helically wound into a hose with the first and second extensions engaging opposite turns of the member to form a continuously smooth outside wall surface and a continuously smooth inside wall surface, said center part and the extensions providing separate cavities when the turns of the member are secured together to form the hose, said reinforcement being disposed in one of the cavities and the helical member being composed of a soft material while the reinforcement comprises a material harder than the material of the helical member and less flexible.

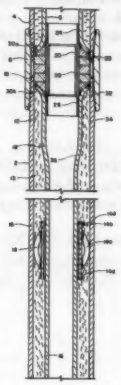
4,531,552
CONCENTRIC INSULATING CONDUIT

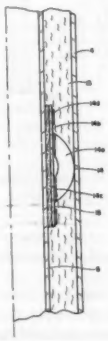
Yung J. Kim, Hacienda Heights, Calif., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed May 5, 1983, Ser. No. 491,864
Int. Cl.³ F16L *59/12*
U.S. Cl. 138—149 **9 Claims**

1. A concentric double walled thermal insulating conduit for forming a tubular string in a subterranean well to transport a heated fluid between the surface of the well and a subterranean location while minimizing the heat loss from the heated fluid during transport, comprising: an outer tubular member; an inner tubular member, the inner and outer tubular member being attached at each end by means of a rigid sealed connection with the inner tubular member being in prestress tension and the outer tubular member being in prestress compression; an annular insulating cavity defined between the inner and outer tubular member and extending along substantially the entire length of the concentric walled conduit; a fibrous blanket insulating material disposed in said annular insulating cavity; and at least one metallic centralizing means for supporting the inner tubular member relative to the outer tubular member and located intermediate the ends thereof; the centralizing means comprising a cylindrical section at least partially concentrically overlapping a portion of the inner tubular member

and multiple load bearing, rigid support sections affixed to the cylindrical section, each comprising a planar section extending radially between the inner and outer tubular members and axially relative to the inner tubular member, each support section being in contact with the interior of the outer tubular





member, and an insulating substrate between the cylindrical section and the inner tubular member whereby the centralizing means prevents radial deflection of the inner tubular member relative to the outer tubular member intermediate the attached ends thereof.

4,531,553

MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING MACHINE CONTAINING A WEAVING ROTOR

Alois Steiner, Rieden, Switzerland, assignor to Sulzer-Rüti Machinery Works Ltd., Rüti, Switzerland

Filed Nov. 28, 1983, Ser. No. 555,592

Claims priority, application Switzerland, Dec. 10, 1982, 7205/82

Int. Cl.³ D03D *41/00*

U.S. Cl. 139—28 **8 Claims**

1. A multiple longitudinal traversing shed weaving machine, comprising:

a weaving rotor rotatable in a predetermined direction of rotation;

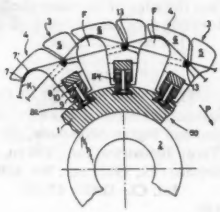
first and second lamellae combs alternatingly arranged at said weaving rotor in said direction of rotation;

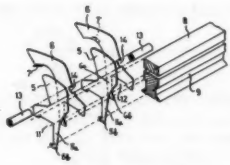
each said first lamellae comb comprising beat-up lamellae for weft threads;

each said second lamellae comb comprising guide lamellae for warp threads and containing shed-retaining elements defining an upper shed position of said warp threads;

groups of warp threads assuming an upper shed position and a lower shed position, respectively, and defining intersection points;

shed-retaining elements defining a lower shed position of said warp threads; and





each said shed-retaining element defining said lower shed position being arranged at one of said intersection points within each pair of lamellae combs formed by one of said first and one of said second lamellae combs and being formed by an element extending substantially parallel to said first and second lamellae combs.

4,531,554

WEAVING MACHINE AND A METHOD FOR PRODUCTION OF A RIBBON-TYPE FASTENER

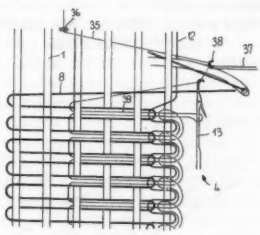
Jakob Müller, Stansstad, Switzerland, and Ferdinand Diesner, Murg-Hänner, Fed. Rep. of Germany, assignors to Textilma AG, Hergiswil, Switzerland

Division of Ser. No. 98,142, Nov. 21, 1979, Pat. No. 4,344,463. This application Oct. 13, 1981, Ser. No. 311,146

Claims priority, application Switzerland, Dec. 5, 1978, 12400/78

Int. Cl.³ D03D *47/40*

U.S. Cl. 139—116 **19 Claims**



1. A method of weaving a ribbon-type fabric in a ribbon type weaving machine having an inserting member for the weft yarn and a movable knitting needle, comprising the steps of inserting from one side of the warp shed a first weft-yarn by means of a weft-yarn inserting tool and forming a first weft-yarn loop; inserting at least one auxiliary yarn over at least a part of the warp shed by means of an auxiliary-yarn inserting tool; drawing-in a second weft yarn between said first weft

yarn and said auxiliary yarn; and drawing the auxiliary yarn so that the auxiliary yarn interlaces on the other side of the warp shed through the first weft-yarn loop with the first weft yarn drawing said second weft yarn into the warp shed thus forming a second weft-yarn loop, and also concomittantly interlacing the auxiliary yarn with itself while guiding at least one auxiliary yarn in the direction transverse the warp yarns and bringing the former, by means of a yarn-carrying element, at varying distances from the edge of the warp shed, into the carrying range of said inserting tool for auxiliary yarn.

4,531,555

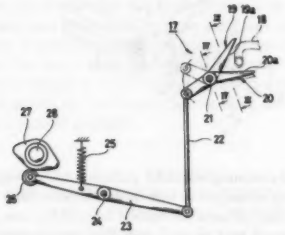
YARN CUTTER FOR SHUTTLELESS LOOM

Hiroyuki Tatematsu; Haruhiko Kusakabe; Masamitsu Takaki; Gendai Kojima, and Sigeru Miyamoto, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,127

Int. Cl.³ D03D *47/34*

U.S. Cl. 139—429 **8 Claims**



1. A yarn cutter for a shuttleless loom, comprising a pair of knife bodies each having a cutting edge and being driven for relative sliding motion in mutual contact, wherein the cutting edge of at least one of said knife bodies comprises at least one ceramic selected from the group consisting of ceramics of oxides, such as an alumina ceramic, a magnesia ceramic, a zirconia ceramic and beryllia ceramic, ceramics of non-oxides such as a silica ceramic, a silicon nitride ceramic and titanium carbide ceramic, and cermet and wherein said zirconia ceramic consists of a dispersion of cubic zirconia or tetragonal zirconia and the content of the tetragonal zirconia is 5 to 70%.

4,531,556

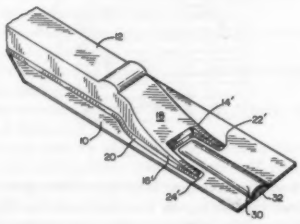
CARRIER TAPE FOR SHUTTLELESS LOOMS

Steven J. Showers, Greensboro, N.C., assignor to Draper Corporation, Greensboro, N.C.

Filed Oct. 24, 1983, Ser. No. 544,501

Int. Cl.³ D03D *47/20*

U.S. Cl. 139—448 **1 Claim**



1. Improvements in the construction of carrier tapes for shuttleless looms of the type in which a weft yarn from a source of supply is inserted by opposed flexible carrier tapes within sheds formed by warp threads, in which the trailing end tails of the carriers are attached to the tape by brazing on either side of a central raised surface or bubble on the tape, said improvement comprising:

(a) said end tails being of a shape tapering from top to bottom in such a manner that the angle of taper is greater near the top and gradually decreases providing a smooth transition of said end tails into said tape so as to reduce flexing stresses therein; and

(b) a metallic filler means heat fused in the underside of said bubble so as to substantially fill and conform to the shape of said bubble, whereby the point of tape flexing is moved to a section of tape that has not been weakened by brazing.

4,531,557

WEFT RESERVOIR FOR FLUID JET LOOMS

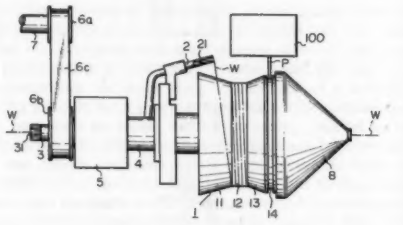
Yujiro Takegawa, Uchinada, and Kanji Tsuji, Kanazawa, both of Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Jun. 29, 1983, Ser. No. 508,857

Claims priority, application Japan, Jul. 2, 1982, 57-115029

Int. Cl.³ D03D *47/36*

U.S. Cl. 139—452 **11 Claims**



1. A weft reservoir for fluid jet looms on which weft is reserved and delivered under pin control, said weft reservoir comprising:

a reservoir drum including an upstream side conical section converging downstream and a downstream side cylindrical section;

a yarn guide annexed to said reservoir drum for supplying weft taken from a given source of supply through relative rotation between said yard guide and said reservoir drum;

a control pin annexed to said reservoir drum with its point being directed to an operative position on the outer periphery of said reservoir drum on the downstream side of said cylindrical section; and

means for keeping said control pin at a stand-by position away from said operative position over a period of time corresponding to the time it takes for a length of weft required for a single weft insertion to be removed from said reservoir.

4,531,558

GASEOUS FUEL REFUELING APPARATUS

Larry J. Engel, Rochester, and John W. Turko, River Rouge, both of Mich., assignors to Michigan Consolidated Gas Co., Detroit, Mich.

Filed Apr. 13, 1983, Ser. No. 484,470

Int. Cl.³ B65B *31/00*

U.S. Cl. 141—44 **23 Claims**

1. An apparatus for supplying low-pressure gaseous fuel to a gaseous fuel consuming device, said apparatus comprising:

inlet means adapted to be connected in fluid communication with a source of gaseous fuel;

compression means for compressing said gaseous fuel in order to increase its pressure to a first predetermined pressure level less than approximately 500 psig (3450 kPa), said compression means having an intake in fluid communication with said inlet means and a compression dis-

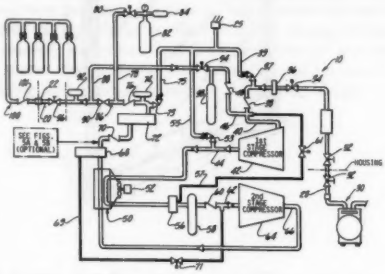
charge outlet for discharging compressed gaseous fuel from said compression means;

cooling means for reducing the temperature of said compressed gaseous fuel;

storage means for storing a predetermined quantity of said compression gaseous fuel, conveying means for conveying said compressed gaseous fuel to said storage means, said storage means including a sorbent material for sorptive storage of said predetermined quantity of said compressed gaseous fuel;

an apparatus discharge means adapted to be selectively and releasably connected to said gaseous fuel consuming device for selectively supplying said compressed gaseous fuel thereto; and

control means for selectively supplying said compressed gaseous fuel to said gaseous fuel consuming device from either said compressor means or said storage means, said



control means causing said compressed gaseous fuel to be supplied to said gaseous fuel consuming device from said storage means when the pressure therein is generally at or above a second predetermined pressure level and further causing said storage means to be bypassed by said compressed gaseous fuel when said storage means pressure drops below a third predetermined level, said control means further causing said compressed gaseous fuel to be supplied to said storage means after said apparatus discharge means has been selectively disconnected from said gaseous fuel consuming device or alternatively after the pressure of the compressed gaseous fuel in said gaseous fuel consuming device has increased to a fourth predetermined pressure level, said compressed gaseous fuel being supplied to said storage means until the pressure in said storage means is generally at said second predetermined pressure level.

4,531,559

CLAMP-ON MARKING TEMPLATE AND SAW GUIDE FOR MAKING DOVETAIL JOINTS

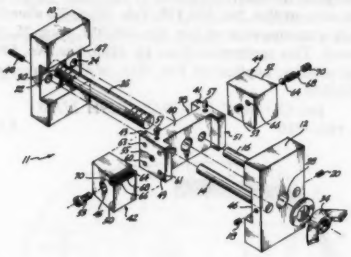
Marion L. Glasgo, 11010 SE. 297th, Auburn, Wash. 98002

Continuation-in-part of Ser. No. 480,890, Mar. 3, 1983, abandoned. This application Mar. 7, 1984, Ser. No. 586,873

Int. Cl.³ B27G *5/02*

U.S. Cl. 144—85 **15 Claims**

6. A tool for guiding saw cuts in the end edges of two boards for joining such edges together in a dovetail joint, said tool comprising an elongated reference member having mutually parallel, flat top and bottom reference faces, each adapted to seat upon such board end edges, said member having a transverse saw guide member rotatably mounted on at least one end thereof, and saw guide face integrally formed on outermost ends of said saw guide member, each such saw guide face capable of being angled either obliquely to the reference faces in a plane perpendicular thereto, or obliquely to the reference faces in a plane parallel thereto depending on the selected position of said rotatably mounted saw guide member, and holder means mounted on said reference member with transversely spaced, parallel elements engageable with the faces of such boards adjoining such end edges and projecting both upwardly and downwardly from the reference member so as to



hold the reference member in fixed transverse relation to the board's end edge with either reference face seated upon such end edge.

4,531,560

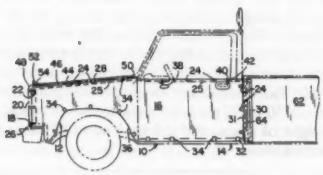
PROTECTIVE COVER FOR VEHICLES

Michael F. Balanky, 8116 Ibach Rd., Jacksonville, Fla. 32216

Filed Dec. 22, 1983, Ser. No. 564,166

Int. Cl.³ B60J *11/00*

U.S. Cl. 150—52 K **12 Claims**

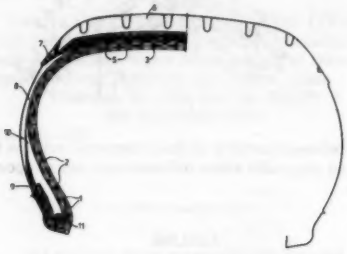


1. A protective cover for an automotive vehicle comprising a hood cover, a pair of front body covers, a pair of rear body covers, and means for removeably attaching each said cover to the outside of the body of said vehicle; said hood cover being substantially identical in size and shape to the outside surface of said hood and being secured to said hood by a plurality of spaced magnet members and a plurality of spaced manually bendable tabular clasp members attached to said hood covers around the perimeter thereof and leaving the hood to be openable with said pair of front body covers attached; said front body covers being substantially identical in size and shape to the outside surface of the front body of the vehicle from the fender and grille to slightly beyond the rear edge of the front doors and being secured to said body by a plurality of spaced magnet members and a plurality of space manually bendable tabular clasp members around the perimeter thereof and by a plurality of spaced manually bendable tabular clasp members around the perimeter of the front wheel wells the front doors being openable with said cover attached and slightly overlapping the front edges of said rear body covers, the front edges of the front body covers being joined to each other by a detachable elastic cord stretched across the grille; and said rear body cover being substantially identical in size and shape to the outside surface of the rear body of the vehicle from the rear edge of the front door to the rear end of the body and secured to the body by a plurality of spaced magnet members and a plurality of spaced manually bendable tabular clasp members around the perimeter thereof and by a plurality of spaced manually bendable tabular clasp members around the rear wheel wells.

4,531,561
WOUND TIRE

Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 352,178, Feb. 25, 1982, abandoned, which is a continuation of Ser. No. 180,911, Aug. 25, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 550,877
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934936
Int. Cl.³ B60C *9/14, 9/20;* B29H *17/08*
U.S. Cl. 152—510 5 Claims



1. A tire comprising a carcass fabric embedded in a rubber mixture with an airtight rubber panel extending over the entire length thereof, the carcass fabric embedded in the rubber mixture and the airtight rubber panel encircling the tire at least twice to thereby form a double encircling coil, the airtight rubber panel projecting axially away from the carcass fabric by at least 10 to 20 mm., and the airtight rubber panel including rubber and the following constituents per 100 parts by weight of rubber: from 30 to 50 parts by weight carbon black, 5 to 15 parts by weight of silica, and 0.5 to 4 parts by weight of an adhesive combination.

4,531,562
INTERIOR WINDOW COVER ASSEMBLY FOR SELECTIVE INSULATING SEALABLE CLOSURE OF A WINDOW OPENING

C. D. Swanson, Lansing, Mich., assignor to Chemstyle, Inc., Lansing, Mich.

Filed Feb. 3, 1981, Ser. No. 231,167
Int. Cl.³ E04F *10/06;* A47H *1/00*
U.S. Cl. 160—26 5 Claims

1. In an interior window cover assembly for selective insulating sealable closure of a window opening comprising:

a pair of vertically oriented spaced-apart track assemblies for opposed sealable engagement along the sides of a window frame defining a window opening;

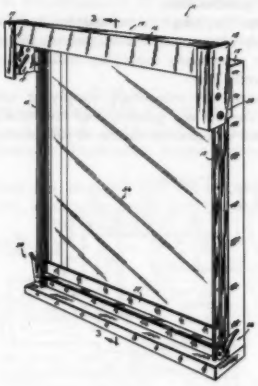
a horizontally oriented spring-actuated window cover roller assembly pivotally mounted across the top of a window frame in abutting engagement with the upper ends of the said track assemblies;

a flexible window cover member rollably mounted in association with said roller assembly so as to be selectively extendable downwardly therefrom so as to cover said window opening, the vertical edge portions of said window cover member being in slidable engagement with said track assemblies;

a horizontally oriented sill closure bar provided in engagement with the lower portion of said flexible window cover member, said sill closure bar in slidable engagement at each end thereof with said track assemblies;

a vertically oriented cam-actuated seal bar provided in each of said track assemblies, each of said seal bars selectively extendable into sealable engagement with said vertical edge portions of said flexible cover member extending into said track assemblies, each of said seal bars selectively retractable into engagement with said window cover roller assembly so as to cause lifting pivotal movement thereof; and

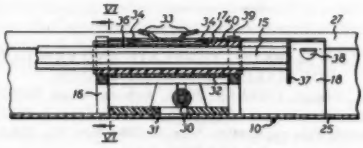
an actuating lock mechanism provided at the bottom of each of said track assemblies so as to lockably retain said sill closure bar in its sealed closure position, said actuating lock mechanism adapted to substantially simultaneously selectively actuate said seal bar downwardly and outwardly into sealable engagement with said vertical edge portions of said flexible cover member, said actuating lock mechanism adapted to substantially simultaneously selectively actuate said seal bar downwardly and outwardly out of engagement with said window cover roller assembly so as to permit transverse sealable engagement thereof with the upper portion of said flexible window cover member.



4,531,563
ARRANGEMENT IN VENETIAN BLINDS

Berndt R. Nilsson, Adolf Fredriksgatan 6, S-217 74 Malmö, Sweden

Filed Jul. 29, 1982, Ser. No. 403,084
Claims priority, application Sweden, Aug. 7, 1981, 8104739
Int. Cl.³ E06B *9/30*
U.S. Cl. 160—168 R 5 Claims



1. An arrangement in Venetian blinds comprising a substantially U-shaped mounting rail with a web and legs turned inwardly at their outer extremities to provide bent flange portions which extend toward said web in spaced relation to said legs and which terminate in inner edges sapced from said web, said rail having lead-ins for the ladder-tapes, cords and slat operating means, the arrangement further comprising bearing blocks inserted in the mounting rail and adapted to support an operating shaft mounted in said bearing blocks by means of bearing bushings and held in position by holddown means, said operating shaft being connected with the ladder-tapes and adapted to control the angular position of said lad-

der-tapes and, thus, the angular position of the salts, the operating means of said arrangement comprising a driving device for said operating shaft and a cord lock, wherein the bearing blocks the hold-down means, the driving device and the cord lock are formed as snap-in components adapted to be mounted in said mounting rail in engagement with said inner edges of said bent flange portions of the legs of said rail without necessitating the use of any special mounting means; and said operating shaft is non-rotatable relative to and extends through the bearing bushings, the hold-down means at one end of said shaft having an abutment face in confronting relation to said one shaft end to lock said shaft against axial movement in one direction, said shaft being locked against axial movement in the opposite direction by said driving device, said hold-down means being formed as U-shaped elements, the webs of which, after mounting, straddle the operating shaft at the bearing blocks and whose legs extend downwardly into said mounting rail and have protruding detents for engagement with the inner edges of the bent flange portions of said mounting rail on the legs thereof, and which said U-shaped elements are formed with means interengaging with means on said bearing blocks for fixing their position relative to the bearing blocks.

4,531,564

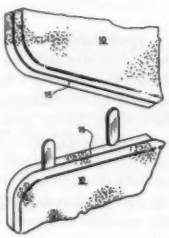
PANEL DISPLAY

Gary D. Hanna, Don Mills, Canada, assignor to G. D. Hanna Incorporated, Ontario, Canada

Continuation-in-part of Ser. No. 441,240, Nov. 12, 1982, which is a continuation of Ser. No. 238,127, Feb. 25, 1981, abandoned. This application Aug. 29, 1984, Ser. No. 645,691

Int. Cl.³ E06B *3/12*

U.S. Cl. 160—351 **14 Claims**



1. A panel assembly comprising at least two panels joined together by one or more connectors, each of the panels comprising two sheet members having respective inner wall portions, the panels being secured to one another with the inner wall portions abutting to define a peripheral slot of predetermined depth along at least one edge thereof, said slot having contiguous opposed side walls where the inner wall portions abut each other; said connector comprising a first end section, a second end section and an intermediate section connecting said end sections, said end sections having rounded outer edges to permit penetration of said opposed slots on said panel members, and said slot being narrower than the thickness of said connector, said connector urging contiguous opposed side walls of said slots from a closed to an open position whereby said connector is grasped in the slots of said panels to interconnect said panels.

4,531,565

GAS HARDENING TYPE MOLDING MACHINE

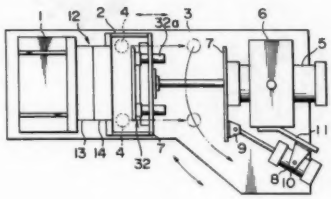
Nagato Uzaki, Toyohashi; Kazuharu Matui, Toyokawa; Shigehiro Toyoda, Toyokawa, and Katuro Hikita, Toyokawa, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Sep. 30, 1982, Ser. No. 428,722

Claims priority, application Japan, Nov. 24, 1981, 56-188618

Int. Cl.³ B22C *15/24*

U.S. Cl. 164—160.1 **3 Claims**



1. A gas hardening type molding machine comprising:

a pair of vertical split die parts forming together a molding box and each having a hollow chamber and a plurality of vent holes for communicating said hollow chamber and a mold cavity with each other;

a pair of die bases comprising a fixed and a movable die base, having said pair of vertical split die parts mounted thereon respectively such that said movable die base having casters for movement thereon, is movable horizontally on a bed relative to said fixed die base;

a die base moving device comprising a cylinder supported by a stationary support member on said bed and having a piston rod connected to said movable die base to move said movable die base in a straight line relative to said fixed die base between a first position where said pair of vertical split die parts are assembled and a second position where said pair of vertical split die parts are separated from each other;

a gas hardenable molding sand supply hopper having an upper part opened in the atmospheric air and a bottom part provided with a discharge port, said hopper being vertically movable with respect to said pair of vertical split die parts assembled at said first position;

a hardening gas supply device communicable with one of the hollow chambers of said pair of vertical split die parts; and

a vacuum device with at least the other of said hollow chambers of said pair of vertical split die parts,

wherein said fixed die base is secured to said bed, while said movable die base is movable on the upper surface of said bed, and

wherein said die base moving device has a second piston rod and a second cylinder supported horizontally and rotatably by said stationary support member and said second piston rod pivotally attached to said cylinder at a plate member disposed on said cylinder, such that when the piston rod of said cylinder is retracted to said second position, said second piston rod of said second cylinder retracts to pull said movable die base in an arc on said casters to a position where said movable die base does not face said fixed die base.

4,531,566

METHOD AND ARTICLE FOR FACILITATING THE MANUFACTURE OF A BONDABLE METALLIC SURFACE

Ralph A. Boettcher, La Verne, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Division of Ser. No. 438,558, Nov. 2, 1982, Pat. No. 4,479,527. This application Apr. 6, 1984, Ser. No. 597,775

Int. Cl.³ B22C 7/02, 9/04

U.S. Cl. 164—246 **8 Claims**

1. An article for use in the lost wax investment casting process, comprising;

a pad having a surface portion at least partly predeterminedly patterned for producing asperities and increasing bondability in a cast surface derived therefrom, and a non-porous portion backing affixed to said patterned portion, said pad being eliminatable at temperatures employed during the lost wax investment casting process, said patterned portion being fixedly conformable to, and releasably attachable, by a bonding agent to a predetermined surface.

7. The article of claim **1** wherein said predetermined surface is a model of a tooth surface.

4,531,567

INJECTION AND FEEDER PIPE FOR APPARATUS FOR CONTINUOUS CASTING OF STEEL

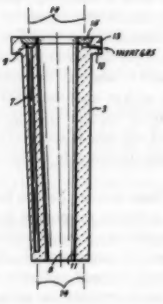
Hans Gruner, Duisburg; Hans Schrewe, Düsseldorf; Fritz-Peter Pleschiutschnigg, Duisburg, and Gerd Diederich, Erpel, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,790

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3149399; Feb. 9, 1982, 3204483; Sep. 22, 1982, 3235515

Int. Cl.³ B22D 11/10

U.S. Cl. 164—415 **10 Claims**



1. In an apparatus for continuous casting of steel, a feeding and injection pipe of fireproof refractory and gas permeable material comprising:

a pipe body having a wall of particular thickness;

a plurality of blind bores longitudinally traversing said wall and arranged concentrically around the axis of the pipe;

an annular channel gas conductively interconnecting said blind bores;

means for closing said blind bores at one end of the pipe body; and

a duct for feeding an inert gas from the outside to the system of bores and channel.

4,531,568

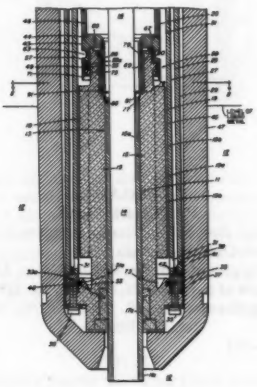
FLUID COOLED CASTING APPARATUS HAVING IMPROVED FLUID SEAL

Calvin Rushforth, Andover, Mass., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 228,549, Jan. 26, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 536,831

Int. Cl.³ B22D 11/124

U.S. Cl. 164—439 **8 Claims**



1. In an improved apparatus for the continuous casting of a metallic strand from a melt in which said apparatus is partly immersed, having a die of a refractory material in fluid communication with said melt, the die substantially defining a mold cavity through which mold cavity said strand is drawn, a thermally conductive coolerbody, surrounding at least a portion of said die to extract heat therefrom, and conduit means for passing a cooling fluid through said coolerbody, said coolerbody having a first end portion positioned below a second end portion, with only said first end portion encompassing said die, the improvement comprising:

O-ring sealing means mounted in a recess of said coolerbody for containing said cooling fluid within said conduit means, said O-ring sealing means comprising:

a resilient first O-ring surrounding said first end portion of said coolerbody;

an annular positioning member secured to said coolerbody and surrounding said first O-ring in compressive engagement therewith;

a resilient second O-ring surrounding said second end portion of said coolerbody; and

a coupling member which receives said second end portion of said coolerbody and surrounds said second O-ring, in compressive engagement therewith;

thermal barrier means within said coolerbody and between said mold cavity and said O-ring sealing means for maintaining the temperature of said O-ring sealing means at a level insufficient to damage said O-ring sealing means.

4,531,569

PROCESS AND APPARATUS FOR PRODUCING TUBES OF REACTIVE METALS

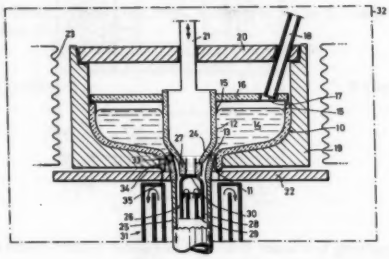
Klaus Fritscher, Cologne, Fed. Rep. of Germany, assignor to Deutsche Forschungs-Und Versuchsantalt Fiir Luft- Und Raumfahrt E.V., Cologne, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,780

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207777

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—464 **15 Claims**



1. A process for producing tubing of high temperature resistant metals comprising:

providing a crucible containing a reactive high temperature resistant metal in a melted state within a controlled environment,

rmoving said melt from said crucible through an annular gap and introducing said melt into a cooling zone, substantially continuously solidifying said melt into a tube of material, said melt first passing in a freely-suspended state through a solidus-liquidus zone during the initial solidification thereof beyond said annular gap before passing into said cooling zone, said cooling and insuing solidification into said tubular material of said melt being achieved substantially exclusively by a gradual heat radiation process.

4,531,570

METHOD AND APPARATUS FOR CONTINUOUSLY CLEANING A HEAT EXCHANGER DURING OPERATION

Hubertus W. A. A. Dries, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1983, Ser. No. 551,744

Claims priority, application Netherlands, Nov. 26, 1982, 8204603

Int. Cl.³ F28G *13/00*

U.S. Cl. 165—1 **6 Claims**

1. A method for continuously cleaning a heat exchanger while it is cooling gas which is polluted by solid particles, comprising:

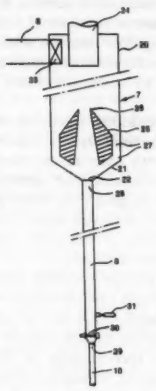
feeding solid cleaning particles into the polluted gas being cooled;

passing the gas containing the cleaning particles through the heat exchanger;

separating the cleaning particles from the treated gas in a vertically disposed cyclone having a central portion which is located below the gas outlet of the cyclone and comprises a tubular element which is virtually centrally arranged in the lower part of the cyclone;

collecting the separated cleaning particles in a virtually vertically disposed, oblong collector which is situated under the cyclone, is virtually aligned with the tubular element in the cyclone and is in open communication with the cyclone; and

passing a gas stream upward through the cleaning particles in the collector and the tubular element in the cyclone in a manner sufficient to create a fluidized bed of cleaning particles which removes impurities from the cleaning particles and builds up a thrust, due to the hydrostatic



head of the bed of cleaning particles, for thrusting cleaning particles toward the heat exchanger and thus causing cleaning particles to be recirculated into the heat exchanger without the aid of mechanical pumping devices.

4,531,571

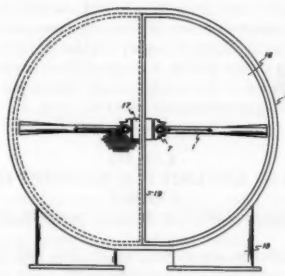
CONDENSER TARGETED CHLORINATION INJECTION SYSTEM

Robert D. Moss, Chattanooga, Tenn., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Apr. 23, 1984, Ser. No. 603,045

Int. Cl.³ F28G *1/00, 1/16, 9/00*

U.S. Cl. 165—1 **5 Claims**



1. In a method for removing from the water contact surface side of utility steam condensers biological fouling organisms adhering thereto by contacting said organisms with chlorine-enriched water passed in contact therewith in concentrations sufficiently high to attack said organisms to effect the loosening thereof from the water contact surfaces of said condenser, and to ensure the removal of said loosened organisms by flushing same with said chlorine-enriched water out of contact with said water contact surfaces of said condenser; the improvement in combination therewith for ensuring that the concentration and time of contact between said chlorine enriched water and said organisms are sufficient to attack, dislodge, and flush said organisms from said surfaces and at the same time ensure that the resulting discharged chlorine-enriched water from said condenser water box and discharge pipe meets prescribed

Federal regulations relating to and restricting effluent chlorine levels, which improved process comprises the steps of:

(1) maintaining a throughput of cooling water, said cooling water being substantially free of total residual chlorine, through at least a substantial portion of the water contact side of said condenser at rates about equal to or simulating the normal operating flow rates for which said condenser is designed, and thereafter removing same to a collection canal means, or the like, by condenser water box and discharge pipe means;

(2) simultaneously contacting relatively small and predetermined amounts of the total water contact surface side of said steam condenser with chlorine-enriched water, said relatively small and predetermined amounts of total water contact surface area ranging from about 2 percent to about 3 percent of the total condenser water contact surface area, the chlorine enrichment of said water ranging from about 5 to about 100 ppm free chlorine;

(3) maintaining said chlorine-enriched water in contact with said relatively small and predetermined amounts of surface area for an accumulated period of time ranging from about 2 to about 5 minutes while maintaining the flow rate of chlorine-enriched water therethrough at flow rates equal to about 10 percent to about 50 percent of the flow rate utilized in the remaining portion of the water contact side of said condenser;

(4) redirecting at least a portion of the stream of unchlorinated cooling water and at least a portion of the stream of said chlorine-enriched water so as to bring into contact with said chlorine-enriched water portions of the water contact surfaces of said condenser which had not been previously exposed thereto until substantially all of said water contact surfaces of said condenser have been contacted with said chlorine-enriched water at the reduced flow rates and for the period of time recited in step 3, supra; and

(5) thereafter mixing said streams of chlorine-free cooling water and chlorine-enriched water in the water box and discharge pipe means from said condenser prior to its introduction into said discharge canal means;

said improved process characterized by the fact that although all of the water contact surfaces of said condenser are exposed to chlorine-enriched water of concentrations up to about 100 ppm for times sufficient to ensure the destruction, dislodging, and flushing of the fouling biological film thereon, the total residual chlorine in the cooling water discharged to said discharge canal does not exceed about 0.2 ppm.

4,531,572

METHOD OF AND UNIT FOR RECOVERY OF WASTE ENERGY

Victor D. Molitor, 7300 West Stetson Place, #46, Denver, Colo. 80213

Continuation-in-part of Ser. No. 191,523, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 130,615, Mar. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 920,660, Jun. 30, 1978, abandoned. This application May 25, 1984, Ser. No. 613,915

Int. Cl.³ F24H *1/00*

U.S. Cl. 165—1 **18 Claims**

14. A method of recovering waste energy from a dishwasher having wash and rinse cycles and the like, comprising:

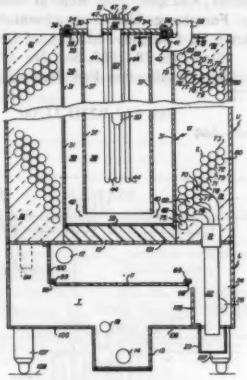
transferring waste wash water from said dishwasher to a collection tank disposed in a lower position;

transferring such waste water from said collection tank to a heat exchanger surrounding a hollow central space and having coils formed by juxtaposed sets of tubing which carry such waste water in one set of tubing and cold feed water for a hot water heater in another set of tubing;

passing said waste water and feed water in countercurrent relationship through said heat exchanger;

passing said preheated feed water to a hot water heater including a tank located in the central space of said heat exchanger;

heating the water in said hot water heater; and



supplying hot water from said hot water heater to said dishwasher at selected times.

4,531,573

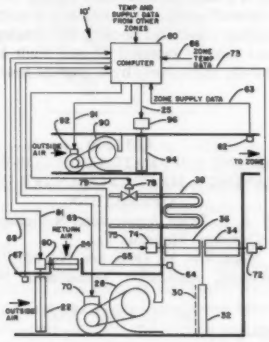
VARIABLE VOLUME MULTIZONE UNIT

William E. Clark, Syracuse, and Donald C. Wellman, Marcellus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 390,606, Jun. 21, 1982, Pat. No. 4,495,986. This application Dec. 19, 1983, Ser. No. 562,676

Int. Cl.³ F24F *3/044*

U.S. Cl. 165—16 **8 Claims**



1. A variable volume multizone system for simultaneously supplying warm, cool and neutral air, as required, to a plurality of zones from a common source comprising:

a variable volume air supply means for supplying air in required amounts;

air cooling means;

a variable multizone section divided into a plurality of units corresponding to the number of zones;

each of said units having a first inlet controlled by a first individual damper means, a second inlet controlled by a second individual damper means, an outlet for supplying conditioned or netural air to a zone and heating means located downstream of said second damper means such that all air flowing into said unit through said second damper means must subsequently pass through said heating means;

a first flow path between said air supply means and said

outlet of each of said units for supplying cool air, as required, to each zone and serially including said air cooling means and the first damper means of each of said zones;

a second flow path between said air supply means and said outlet of each of said units for supplying heated and neutral air, as required, to each zone and serially including said second damper means and said heating means of eacch of said zones and excluding said air cooling means.

4,531,574

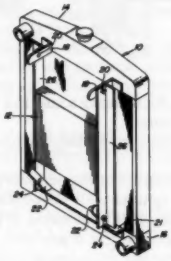
MOUNTING CONNECTING AN OIL COOLER TO A RADIATOR

John J. Hoch, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Dec. 27, 1982, Ser. No. 453,636

Int. Cl.³ F28F *9/00, 7/00*

U.S. Cl. 165—67 **9 Claims**



1. A mounting releasably securing an oil cooler to a radiator, comprising: a plurality of spaced apart spring metal mounting straps fixed to the radiator and including cantilevered portions projecting from the radiator in the direction of the oil cooler; each of the cantilevered portions of the mounting straps carrying a mounting pin intermediate its length and extending crosswise thereto; said oil cooler including a frame having a plurality of spaced holes therein respectively receiving one of the mounting pins; and each cantilevered portion extending beyond said frame and terminating in an end which is free of said frame, whereby the oil cooler may be disconnected from the radiator by removing the pins from the holes by grasping the free ends of and deflecting the mounting straps.

4,531,575

RADIATORS

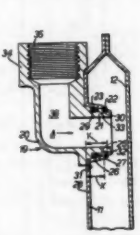
Dennis M. Webster, Kingston-upon-Hull, England, assignor to Myson Group Limited, Ongar, England

Filed Aug. 19, 1981, Ser. No. 294,189

Claims priority, application United Kingdom, Aug. 22, 1980, 8027339

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—78 **8 Claims**



1. A connector assembly for connecting a fluid flow circuit component to at least one back connection heat exchange radiator, said radiator comprising a panel formed of first and second superimposed preformed metal sheets, said first sheet defining a socket member, and wherein said connector assembly comprises:

a connector having a first end formation adapted to cooperate with said fluid flow circuit component, and a second end formation comprising a first spigot member interengageable with said socket member;

first resilient latching means providing on said spigot member including a first latching surface defining an incomplete annulus on said spigot member, said annulus having at least one gap between portions of said first latching surface; and

second latching means including a second latching surface provided on said socket member for cooperating with said first resilient latching means, such that said connector and said panel of said radiator are connectable via an inward push-fit, fluid tight latching engagement of said first latching surface on said spigot member with said second latching surface of said socket member during which said first latching means deforms resiliently as said first latching surface is pushed past said second latching surface, and then releases resilient after said first latching surface has engaged said second latching surface, said resilient deformation causing said at least one gap to narrow and said resilient releasing causing said gap to widen towards its original width.

4,531,576

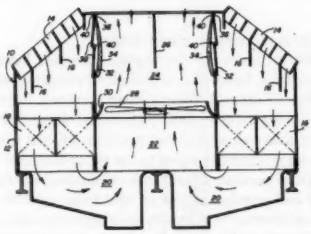
APPARATUS FOR COOLING FLUIDS

Walter Kals, Hastings-On-Hudson, N.Y., assignor to Niagara Blower Co., Buffalo, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,207

Int. Cl.³ F28F *13/06*

U.S. Cl. 165—108 **3 Claims**



1. A heat exchange device for cooling a fluid, comprising:

housing means having air duct means therethrough;

heat exchange means in said air duct means;

air circulation means in said air duct means downstream of said heat exchange means for drawing a stream of air through said air duct means past said heat exchange means;

plenum means downstream of said air circulation means and including an exhaust port through which the air is exhausted to atmosphere;

a return port in said plenum means for returning at least some air back to said duct means at a point upstream of said heat exchange means;

air recirculation means operatively associated with said plenum means, said exhaust port and said return port and movable between positions closing either of said ports for selectively recirculating all, some or none of the air stream in said plenum means back through said return port; and

damper means disposed in said return port for selectively opening and closing said return port in response to the position of said air recirculating means and the operative condition of said air circulating whereby said air recircu-

lation means can close said plenum means and said damper means can close said return port to prevent back draft through the device when said air circulation means is inoperative.

4,531,577

HEAT EXCHANGER WITH A PLURALITY OF INDIVIDUAL TUBULAR PARTS AND PROCESS FOR THE MANUFACTURE THEREOF

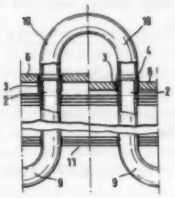
Bohumil Humpolik, Ludwigsburg, and Vlastimil Kluna, Kornwestheim, both of Fed. Rep. of Germany, assignors to Suddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 15, 1982, Ser. No. 388,607

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126030

Int. Cl.³ F28D 1/00

U.S. Cl. 165—150 11 Claims



1. A heat-exchanger, comprising:

a plurality of inner tubular shaped elements having enlarged end portions having an essentially cylindrical shape;

a plurality of outer tubular shaped elements having end portions having an essentially cylindrical shape, the inner diameter of said cylindrical end portions of said outer elements being approximately equal to the outer diameter of the cylindrical end portions of said inner elements, wherein the cylindrical end portion of one of said inner tubular shaped elements is inserted into axially overlapping position within the cylindrical end portion of each of said outer tubular shaped elements to produce a plurality of tube joints lying substantially in a single plane;

a pressure platen having a number of orifices therethrough corresponding to the number of said tube joints, wherein the pressure platen surrounds the inner and outer tubular shaped elements at said tube joints and the diameter of said orifices is at least in a portion thereof sufficiently smaller than the outer diameter of the cylindrical end portions of said outer tubular shaped elements to produce a plastically deformed pressure fit between said inner and outer tubular shaped elements, said pressure platen being positioned with orifice portions having a smaller diameter than the outer diameter of the cylindrical end portions of said outer tubular shaped elements disposed around the overlapping cylindrical end portions of the inner and outer tubular shaped elements between the free ends of the overlapping cylindrical end portions, and wherein the pressure fit comprises a radially inwardly directed deformation of both the inner and outer tubular shaped elements between the free ends of overlapping cylindrical end portions, the outer diameter of the inner tubular shaped element in the plastically deformed area of said pressure fit being smaller than the outer diameter of the remainder of the inner tubular shaped element.

4,531,578

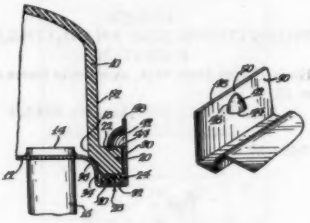
TANK-HEADER PLATE CONNECTION

Kevin E. Stay, Greenfield, and John E. Munch, Jr., Racine, both of Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Jun. 28, 1984, Ser. No. 626,538

Int. Cl.³ F28F 9/12, 9/14

U.S. Cl. 165—175 6 Claims



1. A connection for securing a tank to a header plate in a heat exchanger comprising:

a metal header plate supporting the open ends of a plurality of tubes;

a groove extending about the periphery of said header plate and having a bottom wall surrounded by an upstanding, deformable side wall terminating in an edge;

a compressible gasket in said groove;

a plastic tank having an opening surrounded by an outwardly extending flange, said flange being sized and configured to be fitted within said groove with one side of the flange abutting said gasket and the opposite side of the flange within the groove and spaced from said edge, said tank compressing said gasket so that said gasket effects a seal between said tank and said header plate; and

a plurality of tabs in said side wall below said edge and overlying said opposite side to hold said tank in compressing relation to said gasket, each said tab being formed by deformation and piercing of said side wall to having a generally curved nominally planar, free edge in contact with said opposite side of said flange and tapering from said free edge toward said side wall edge to merge into said side wall prior to or at said side wall edge.

4,531,579

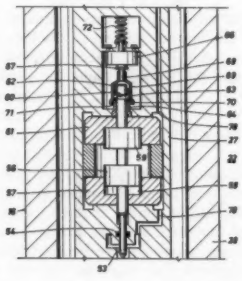
VALVE LATCH DEVICE FOR DRILLING FLUID TELEMETRY SYSTEMS

Michael L. Larronde, Houston, and Robert G. Hoos, Porter, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,649

Int. Cl.³ E21C 7/06

U.S. Cl. 166—66 24 Claims



1. A valve operating and latching apparatus suitable for use

in a borehole drilling fluid telemetry system for transmitting data by imparting detectable pressure pulses to a drilling fluid circulating down the pipe string and up the borehole annulus wherein said pulses are imparted by operation of a valve for altering the flow of drilling fluids, comprising:

valve operating means having a movable member for moving a movable valve means for opening and closing a fluid flow path thereby modulating the flow of said drilling fluid;

latch means for preventing the movement of said movable member, wherein said latch means comprises

first engagement means operably connected to said movable valve means;

second engagement means operably connected to a selectively operable disengaging means;

latch means positioned between said engagement means; and

means normally biasing said second engagement means into a position forcing said latch means into latching engagement with said first engagement means to prevent said movable valve means from moving;

said means for selectively disengaging said latch means to permit movement of said movable member; and

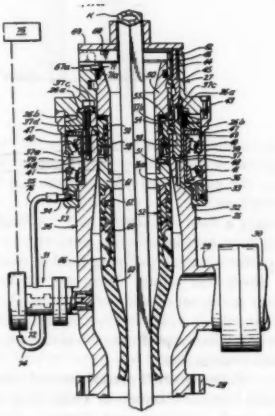
means for operating said selectively disengaging means.

4,531,580

ROTATING BLOWOUT PREVENTERS

Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jul. 7, 1983, Ser. No. 511,752
Int. Cl.³ E21B *33/06*
U.S. Cl. 166—84 **32 Claims**



1. A rotating blowout preventer including,

an annular body adapted to be connected to the upper end of a well casing,

a rotatable element extending through the body,

an annular support housing within the body,

a sealing assembly carried by the housing for sealing the annular space between the body and said rotatable element,

a bearing assembly capable of supporting a predetermined normal pressure load and located between said housing and its sealing assembly and the body for rotatably mounting the housing and sealing assembly within the body, whereby the sealing assembly may rotate with the element with which it is sealingly engaged,

means for applying to said bearing assembly the pressure load acting upon the sealing assembly when in its sealing position, and

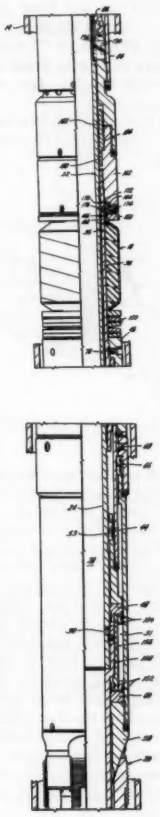
means coacting with the bearing assembly for transferring the excess pressure load from the bearing assembly directly to the annular body of the blowout preventer when said pressure load exceeds the predetermined normal pressure load.

4,531,581

PISTON ACTUATED HIGH TEMPERATURE WELL PACKER

Ronald E. Pringle, Houston, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 8, 1984, Ser. No. 587,477
Int. Cl.³ E21B *33/128*
U.S. Cl. 166—120 **3 Claims**



1. In a well packer adapted to set in a conduit for closing a well bore, having a housing and a mandrel, an initially retracted packer seal means surrounding said mandrel, initially retracted slip means surrounding said mandrel, hydraulic actuated means for expanding the packing seal, hydraulic actuated means for expanding the slip means, port means through the mandrel for supplying hydraulic fluid to both hydraulic actuated means, the improvement in seal means for allowing the packer to be used in high temperature environments comprising,

each of said hydraulic actuated means including a metal piston movable in a hydraulic chamber, each of said pistons being ring shaped with cup-shaped sealing surfaces

extending from the piston towards said port means for sealing against the chamber by the hydraulic fluid,

first and second abutments surrounding the mandrel and positioned adjacent one end of the packing seal,

a metal seal ring between the abutments,

coacting wedge surfaces on the metal seal and each of the abutments positioned inside of the abutments whereby when the packer seal is set and the abutments are moved together they will coact with the metal seal to provide a seal between the coacting wedge surfaces and also wedge the metal seal inwardly for sealing,

a metal static seal between the housing and said mandrel,

said housing including thread means for compressing said metal static seal.

4,531,582

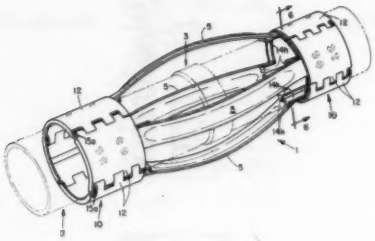
WELL CONDUIT CENTRALIZER

John F. Muse; Harry W. Riddle; Frank S. Zeller, and Juventino Buruato, all of San Antonio, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Oct. 31, 1983, Ser. No. 547,408

Int. Cl.³ E21B *17/10*

U.S. Cl. 166—241 **5 Claims**



1. A well conduit centralizer, comprising a pair of hingedly connected segmented means mountable in axially spaced slidable relation on a length of conduit; each segment of each segmented means being rigidly secured to an end of an outwardly bowed leaf spring; each said segment initially comprising a unitary rectangular sheet having a length dimension greater than its width and two parallel width edges which is deformed by double folding and stamping into an arcuate double walled segment with one of said walls having said parallel width edges disposed in axially parallel, adjacent relationship to separate said one wall into two portions, said double walled segment having apertures spaced along each fold area, thereby defining spaced hinge elements for pivotal connection to the hinge elements of an adjacent segment by hinge means; said leaf spring ends being respectively inserted within axially spaced double walled segments and secured to both walls of each double walled segment by welding both portions of said one wall and the other wall to said inserted leaf spring end.

4,531,583

CEMENT PLACEMENT METHODS

Lowell W. Revett, Youngsville, La., assignor to Halliburton Company, Duncan, Okla.

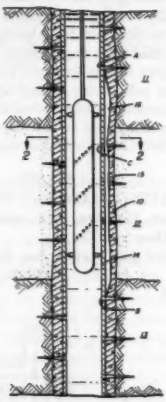
Continuation-in-part of Ser. No. 282,115, Jul. 10, 1981, abandoned. This application Mar. 9, 1983, Ser. No. 473,832

Int. Cl.³ E21B *33/138, 47/04*

U.S. Cl. 166—253 **6 Claims**

1. A method for placing cement in vertical channels or voids in a cement sheath between the casing and borehole wall in a cased well borehole in which undesirable water cut is entering production perforations from a suspected water bearing formation above or below a producing formation via such vertical channels or voids, comprising the steps of:

perforating the casing of the borehole to produce intersecting perforations at a location between said production perforations and said suspected water bearing formations over a vertical interval of the casing sufficient to allow substantially the entire circumference of the casing to be perforated by a spiral arrangement of shaped charge perforating charges arranged in substantially a 15° azimuthal phasing relationship to each other and approximately centered in the casing, said shaped charges having entrance holes into the casing of sufficient diameter and being vertically spaced apart over said vertical interval of casing to assure a high probability of intersecting any vertical channel or voids in said cement sheath to be intersected by at least one such shaped charge perforations at some level in said vertical interval;



running a cement retainer packer into the casing on a tubing string and setting said cement retainer in the casing between the production perforations and the intersecting perforations;

establishing a fluid circulation path for fluid exterior to the casing from said intersecting perforations to said production perforations by pumping fluid at relatively low pressure down said tubing string and through said cement retainer in one set of said perforations, through said vertical channels or voids in the cement sheath and into the other of said set of perforations on the opposite side of said cement retainer; and

placing a relatively small predetermined quantity of cement into said vertical channels or voids by pumping said relatively small predetermined quantity of cement at said relatively low pressure in said fluid circulation path.

4,531,584

DOWNHOLE OIL/GAS SEPARATOR AND METHOD OF SEPARATING OIL AND GAS DOWNHOLE

James E. Ward, Houston, Tex., assignor to Blue Water, Ltd., Houston, Tex.

Continuation of Ser. No. 546,290, Oct. 28, 1983,. This application Feb. 6, 1984, Ser. No. 577,554

Int. Cl.³ E21B *43/38*

U.S. Cl. 166—265 **23 Claims**

1. A fluid separator adapted to be mounted in a producing oil/gas well for substantially separating gas from oil of a oil/gas mixture, comprising:

a generally cylindrical housing forming a separation chamber, said housing having an inlet at the bottom of said housing located below said separation chamber adapted to receive an oil/gas mixture for introduction into said separation chamber;

said housing including an oil flow outlet for directing separated oil outwardly of said housing and a gas flow outlet for directing outwardly separated gas, said oil and gas flow outlets being located above said separation chamber;

continuous flow separation means mounted with said separation chamber for receiving said oil/gas mixture from said inlet, for separating gas from the oil/gas mixture and for directing separated oil out of said oil flow outlet and separated gas out of said gas flow outlet;

said continuous flow separation means including means for imparting an upward helical velocity to said entering oil/gas mixture to cause a separation of said oil/gas mixture into oil and gas and means for directing separated oil to said oil glow outlet and separated gas to said gas flow outlet;

said inlet, oil flow outlet, separation chamber and continuous flow separation means cooperating to provide fluid treatment means through said separator for delivering downwardly through said separator oil well treatment fluid;

said continuous flow separation means includes a plurality of separation stages positioned in said housing separation chamber between said inlet and said outlets; and

said plurality of separation stages mounted within said separation chamber including a first stage for imparting the greatest separation velocity and making the greatest separation of gas from said oil/gas mixture and with each stage thereafter located between said first stage and said outlets successively imparting lesser velocity and lesser separation such that said gas is removed from said oil/gas mixture in stages.

18. A method of separating oil and gas from oil/gas mixture downhole in a producing oil well, comprising the steps of:

providing a production string extending from the surface into the borehole and terminating in the production zone;

mounting an oil/gas separator onto the end of the production string and installing a packer between a lower and upper section of the oil/gas separator such that the inlet of the oil/gas separator is located below the packer and the outlets therefor are located above the packer;

providing for the entry of producing oil/gas mixture into the lower section of the oil/gas separator and providing a helical annular velocity tunnel through the oil/gas mixture to cause said oil under centrifugal force to move radially outwardly and causing said separated gas to move radially inwardly into a central collection zone in said lower section of the oil/gas separator so that the separated gas in said lower section of the oil/gas separator is directed through the packer and outwardly of the oil/gas separator above the packer;

directing the oil separated in said lower section upwardly through the packer and into the end of the production tubing so that such oil can be pumped upwardly by a downhole pump mounted in the production tubing; and

providing the annular helical velocity tunnel within the oil/gas separator in a series of stages, the lowest stage in the oil/gas separator imparting the greatest separating velocity to the oil/gas mixture entering the oil/gas separator with subsequent, upper stages providing decreasing separating velocity by stage.

4,531,585

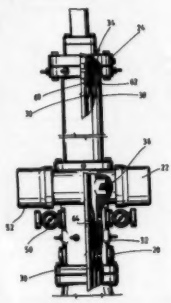
SAFETY SHEAR APPARATUS AND METHOD FOR PRODUCTION WELLS

Asger Hansen, 15611 River Ridge Ct., Houston, Tex. 77068

Filed Sep. 12, 1983, Ser. No. 531,553

Int. Cl.³ E21B *33/06*

U.S. Cl. 166—297 **11 Claims**



1. A safety shear apparatus for use on a production oil and-/or gas well comprising,

a lower tubing head,

an upper tubing head,

a tubing extending from the well upwardly through the lower head and into the upper head, said tubing sealingly engaging each head,

means for supporting the tubing from only one of the tubing heads,

sealing and shear rams positioned between the lower and upper heads for shearing the tubing and sealing and positioned outside of the tubing whereby the rams are isolated from the well bore fluids flowing through the tubing, and

means for allowing the sheared tubing to move away from the shear rams a predetermined distance after shearing to allow the rams to seal.

4,531,586

METHOD OF SOLVENT STIMULATION OF HEAVY OIL RESERVOIRS

James M. McMillen, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 307,544, Oct. 1, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 564,044

Int. Cl.³ E21B *43/22, 43/40*

U.S. Cl. 166—305 R **10 Claims**

1. A method for solvent stimulation of heavy crude oil from an underground reservoir penetrated by a well, which comprises:

(a) injecting into the reservoir a liquid solvent having such a viscosity that the ratio of the crude oil viscosity to solvent viscosity is at least about 10, to form solvent fingers near the well, and in an amount between about 5 barrels and about 25 barrels per foot of oil-bearing formation to provide adequate solvent fingering near the wellbore and significantly reduce the viscosity of the heavy crude oil; and

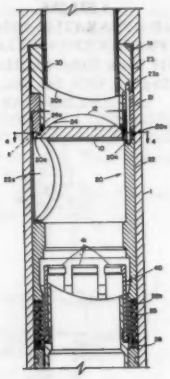
(b) thereafter producing a solvent-oil mixture.

4,531,587

DOWNHOLE FLAPPER VALVE

Douglas H. Fineberg, Broken Arrow, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 22, 1984, Ser. No. 582,482
Int. Cl.³ E21B *34/06, 43/12*
U.S. Cl. 166—332 **14 Claims**



1. In a valve for use in controlling flow in a fluid transmission conduit in a subterranean well: a valve flapper rotatable between open and closed positions for controlling the flow in the fluid transmission conduit; the valve flapper having the configuration of a transverse section of an annular cylindrical member defined by an intersecting cylindrical surface having an axis perpendicular to the axis of the cylindrical member; a flapper hinge about which the valve flapper rotates; a valve seat to hold pressure exerted on the upstream valve flapper face in the closed position; an axially reciprocal tubular actuating member having an annular end face abutting the downstream face of the valve flapper upon movement of the actuating member in the upstream direction to exert a resultant upstream force on the valve flapper for opening the valve flapper; and contoured surface means on said annular end face of the actuating member and on the downstream valve face for establishing, during rotation of the valve flapper to open position, changing contact points between said end face of the actuating member and the downstream valve face through which the upstream force exerted by the actuating member on the valve flapper remains in close radial alignment with the resultant pressure force exerted on the valve flapper during initial rotation of the valve flapper about the flapper hinge between the closed and open positions, whereby the couple created by the oppositely directed upstream force exerted by the actuating member on the valve flapper and by the resultant pressure force is minimized to reduce bending and shear on the flapper hinge.

4,531,588

FIRE SUPPRESSION SYSTEM

Wilhelm A. Brünsicke, Santa Monica, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 6, 1984, Ser. No. 577,639
Int. Cl.³ A62C *1/20*
U.S. Cl. 169—9 **12 Claims**

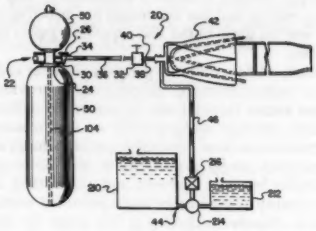
1. A fire suppression system comprising:

first dispensing means adapted to provide a flow of liquid fire suppressant chemical at a constant pressure to a first outlet port;

first valve means coupled to said first outlet port adapted to control the flow of said liquid chemical to a second outlet port as a function of the inlet temperature thereof;

second valve means coupled to said second outlet port of said first valve means adapted to meter said liquid chemical as a function of the inlet pressure level thereof and selected flow rate of same and to cause said liquid chemical to partially vaporize forming a liquid/vapor phase first mixture and provide said first mixture to a third outlet port coupled thereto;

second dispensing means adapted to provide a second mixture of water and foam-generating agent at a constant pressure; and



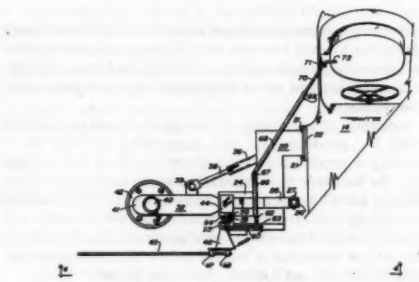
nozzle means coupled to said second dispensing means, said third output port of said second valve means and to a source of ambient air, said nozzle means adapted to fully vaporize said first mixture and expand said vaporized chemical to ambient pressure and thereafter combine it with ambient air forming a third mixture and to further combine said third mixture with said second mixture and by encapsulation forming a foam wherein said bubbles of said foam contain said third mixture.

4,531,589

RETRACTABLE TILLER FOR INSTALLATION AT SIDE OF TRACTOR

Abbott R. Williams, 1195 Cuttings Wharf Rd., Napa, Calif. 94558

Filed Feb. 15, 1983, Ser. No. 466,547
Int. Cl.³ A01B *13/04*
U.S. Cl. 172—5 **13 Claims**



13. In a retractable tiller for installation at one side of a tractor, having a stationary frame, a tiller frame pivoted to said stationary frame via a stationary horizontal pivot, and power means for moving said tiller frame up and down about said horizontal pivot, a tilling head at the outboard end of said tiller frame, said tilling head having a plurality of tines in a rotary assembly the combination therewith wherein said power means comprises

hydraulic means for holding the tines of said tilling head down

in the soil at a predetermined vertical position, comprising an hydraulic circuit with a tee valve set to maintain downward pressure on said head, and

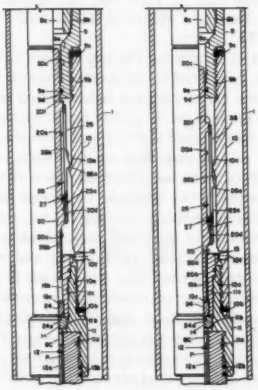
manually controlled valve means for, when actuated, moving said valve so that resistance to pressure returns hydraulic fluid to a reservoir, thereby enabling a predetermined obstacle force to push said tilling head and frame upwardly.

4,531,590

FLUID PRESSURE ACTUATED PERFORATING GUN

Elmer R. Peterson, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Mar. 26, 1984, Ser. No. 593,364
Int. Cl.³ E21B *43/112*
U.S. Cl. 175—4.52 **16 Claims**



1. An actuator for a well perforating gun having a primer ignitable by the application of impact energy reaching a predetermined amount, comprising: a housing fixedly supporting the primer; a firing means axially shiftably mounted in said housing above said primer, whereby downward movement of said firing means transfers impact energy to said primer; radially shiftable, resiliently biased means for securing said firing means in a elevated position relative to said primer; said securing means being responsive to a predetermined downward force to shift radially against said resilient bias to release said firing means; said fluid pressure responsive means for exerting sufficient downward force on said firing means to release same from said securing means and drive said firing means into said primer.

4,531,591

DRILLING HEAD METHOD AND APPARATUS

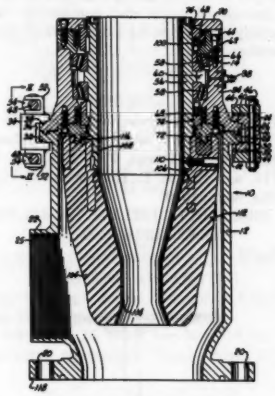
Vaughn R. Johnston, Washington, Pa., assignor to Washington Rotating Control Heads, Washington, Pa.

Filed Aug. 24, 1983, Ser. No. 526,067
Int. Cl.³ E21B *33/03*
U.S. Cl. 175—57 **17 Claims**

1. In a drilling head adapted to provide a seal about the periphery of a drill string passed therethrough during drilling wherein the drilling head includes a stationary housing adapted to be mounted on a well casing and a rotary spindle assembly mounted for rotation with respect to the housing in sealed rotary bearings retained within said housing and wherein a sealing means forms a sealed rotary interface between the relatively rotatable housing and spindle assembly to contain bearing lubricant, the improvement comprising:

said drilling head including flow inlet means for directing a flow of lubricant to said rotary bearings for lubrication thereof and flow metering means for directing such lubricant from said bearing means to said sealing means at a predetermined limited flow rate whereby a flow of lubricant delivered under pressure to said flow inlet means is effective to provide drilling head lubrication in a manner that said rotary bearings are continuously flooded with lubricant at a relatively elevated pressure and sealing means is lubricated with a metered flow of lubricant at a relatively reduced pressure from that of the lubricant which lubricates said rotary bearings.

16. In a drilling head wherein a stationary housing carries a rotary spindle assembly which includes a resiliently flexible packer for providing a seal about the periphery of a rotary drill string passed therethrough, the method of imparting rotation to the rotary drill string passed therethrough, the method of imparting rotation to the rotary spindle assembly for rotation



thereof with the drill string and with respect to the housing comprising the steps of:

resiliently deforming said packer by passing said drill string therethrough;

engaging said packer about the periphery of said drill string passed therethrough to provide a frictional grip on said drill string in response to the innate propensity of said packer to resile to an undeformed state; and

limiting the rotary friction between said housing and said spindle assembly to a magnitude sufficiently less than the magnitude of friction between mutually engaged surfaces of said packer and said drill string that during relative rotation between said drill string and said housing said spindle assembly is rotated concomitantly with said drill string exclusively by the frictional engagement between said packer and said drill string.

4,531,592

JET NOZZLE

Asadollah Hayatdavoudi, 101 Harwell, Lafayette, La. 70503

Filed Feb. 7, 1983, Ser. No. 464,672
Int. Cl.³ E21B *10/60*
U.S. Cl. 75—67 **20 Claims**

1. An earth drill bit apparatus comprising:

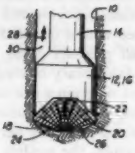
a drill bit body;

a cutting means extending downward from said drill bit body;

a nozzle passage means, disposed in said drill bit body and having a downwardly open nozzle outlet located above a lowermost portion of said cutting means, for directing a jet of drilling fluid downward toward a bottom of a hole being drilled by said cutting means; and

an elongated jet extension member extending substantially

axially downward from said nozzle outlet, said jet extension member having a peripherally encompassing external surface extending generally parallel to a longitudinal axis of said jet extension member, said extension member being



PRIOR ART

so arranged and constructed that said jet of drilling fluid flows downward about and completely surrounds said peripherally encompassing external surface of said extension member.

4,531,593

SUBSTANTIALLY SELF-POWERED FLUID TURBINES

Guy R. B. Elliott, 133 La Senda Rd., Los Alamos, N. Mex. 87544; Milton W. McDaniel, P.O. Box 488, Cimarron, N. Mex. 87714, and Barton L. Houseman, 17 Galloway Ave., Cockeysville, Md. 21030

Filed Mar. 11, 1983, Ser. No. 474,356
Int. Cl.³ E21B *4/00, 7/00*
U.S. Cl. 175—71 **2 Claims**

1. A substantially self-powered method of recovering watered out natural gas comprising:

(a) providing at least one well into at least one formation containing the said watered out natural gas such that fluids from the said formation can flow into the said well,

(b) emplacing at least one centrifugal turbine in the said well,

(c) providing at least one conduit through which gas substantially at or below formation pressures can flow from the said centrifugal turbine to lower pressures substantially at the earth's surface,

(d) providing at least one additional conduit through which liquids can flow to be discharged,

(e) providing means for substantially separating natural gas and brine,

(f) flowing fluid from the said formation and to the said centrifugal turbine in the said well,

(g) expanding the said fluid in the said centrifugal turbine, thereby providing self-powering,

(h) separating the said expanded fluid into released natural gas and spent brine,

(i) flowing the said released natural gas from the well, through the said one conduit and substantially to the earth's surface,

(j) flowing the said spent brine from the said well and through the said additional conduit means to discharge, and

(k) allowing brine circulation in formations adjacent to the well corollary to brine flow into and out of the well.

4,531,594

METHOD AND COMPOSITIONS FOR FLUID LOSS AND SEEPAGE LOSS CONTROL

Jack C. Cowan, Lafayette, La., assignor to Venture Chemicals, Inc., Lafayette, La.

Filed Oct. 25, 1982, Ser. No. 436,265
Int. Cl.³ C09K *7/06;* **E21B** *7/00*
U.S. Cl. 175—72 **11 Claims**

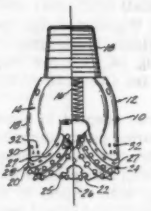
1. A method of decreasing the loss of fluid to the subterranean formation contacted by an invert emulsion drilling fluid, which comprises: (1) preparing a concentrated pill containing from about 10 pounds per 42 gallon barrel (ppb.) to about 75 ppb. of a fluid loss control additive and from about 10 ppb. to about 75 ppb. of a seepage loss control additive in a liquid which is compatible with said invert emulsion drilling fluid; (2) circulating said pill in the borehole traversing said formation containing said invert emulsion drilling fluid to coat the wall of the borehole with said fluid loss control additive and said seepage loss control additive; (3) isolating said pill from said invert emulsion drilling fluid after said pill has been circulated throughout said borehole; (4) continuing the circulation of said invert emulsion drilling fluid; and (5) periodically repeating steps (2) and (3) as necessary to decrease the loss of fluid to said formation from said invert emulsion drilling fluid; wherein said fluid loss control additive is an organophilic polyphenolic acid said polyphenolic acid being humic acid or a humic acid containing material and wherein said seepage loss control additive is selected from the group consisting of cellulose which has been treated to be hydrophobic and organophilic, dried bagasse, dried peat, lignite, calcium carbonate, finely ground nut shells, and finely ground mica.

4,531,595

WEAR RESISTANT COMPOSITE INSERT AND BORING TOOL WITH INSERT

Robert J. Housman, 37 Bearpaw, Irvine, Calif. 92714

Continuation of Ser. No. 233,065, Feb. 10, 1981, abandoned, which is a division of Ser. No. 1,900, Jan. 8, 1979, Pat. No. 4,274,840. This application May 28, 1982, Ser. No. 383,131
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **12 Claims**



1. An improved insert for use in earth boring tools and the like comprising a mixture of consolidated tungsten-carbide and Invar with diamonds at the wear surface, the Invar being sintered and the diamonds being bonded to the mixture.

4,531,596

TOOL FOR BORING AN ENLARGED PORTION WITHIN THE INTERIOR OF A HOLE AND A TILTABLE TOOL FOR COMPLETING THAT TOOL

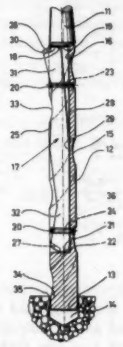
Werner Kleine, Achim-Uesen, Fed. Rep. of Germany, assignor to Gebruder Heller Dinklage GmbH Werkzeugfabrik, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,192

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240859

Int. Cl.[3] E21B *10/32*

U.S. Cl. 175—384 16 Claims



1. A tool for boring an enlarged portion within a hole having at least one open end surrounded by an edge, said enlarged portion being spaced from said open end, said tool comprising an elongated shaft having a leading end, a shank, and a groove which extends along a portion of said shaft and has at least one opening extending along said shaft, further comprising a tiltable tool within said groove, the tiltable tool having a cutting arm adjacent to said leading end and an actuating arm adjacent to said shank of said shaft, said tiltable tool being so formed and having a tiltable support within said groove for tilting said cutting arm from an ineffective position into effective positions so that when said cutting arm is in said ineffective position within said groove said actuating arm extends out of said opening of said groove, so that it can be actuated by said edge surrounding said open end of said hole to move said cutting arm into a cutting position for cutting said enlarged portion of said hole.

4,531,597

APPARATUS FOR FORMING TOBACCO PORTIONS

Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

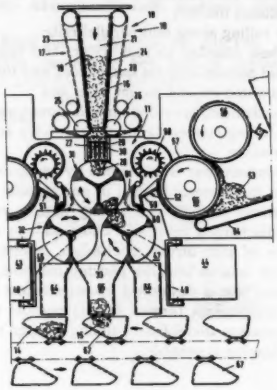
Filed Jun. 28, 1983, Ser. No. 508,758

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226654

Int. Cl.[3] G01G *13/02, 13/22*

U.S. Cl. 177—84 16 Claims

1. Apparatus for forming portions of fibrous material, particularly cut tobacco, by separating a preferably underweight rough portion from a strand of the fibrous material and the addition of an equalising portion determined by the weighing of the rough portion, wherein a plurality of balances, in particular two, are adapted to be fed alternately with individual rough portions and the complete portions can be carried away, characterised in that the rough portions (28) separated from the tobacco strand (16) are each received in a compartment (34, 35, 36) of a rotatable intermediate conveyor (31) and



through the partial rotation of the latter can be fed to one or the other precision balance (43,44).

4,531,598

MOVABLE ARTICLE DISCHARGER IN AN AUTOMATIC WEIGHING APPARATUS

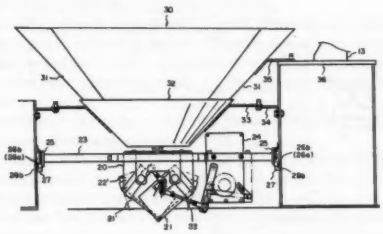
Kazumi Kitagawa, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 20, 1982, Ser. No. 419,928

Claims priority, application Japan, Sep. 22, 1981, 56-140765[U]

Int. Cl.[3] G01G *23/00, 13/00*

U.S. Cl. 177—128 4 Claims



1. An automatic weighing apparatus for a packing machine, comprising:

weighing machines each having a weighing mechanism for weighing articles contained by said weighing machines;

combination means, operatively coupled to said weighing machines, for combining weight values produced by respective ones of said weighing machines, and for selecting a combination of weighing machines whose weighed values give a total value equal or closest to a preset weight value and causing discharge of same;

a chute, positioned below said weighing machines, for receiving articles discharged from the selected combination of weighing machines;

a timing hopper disposed below said chute for receiving from said chute the articles discharged from the selected combination of weighing machines, and for discharging the articles into the packing machine, said timing hopper performing the receiving and discharging operations while positioned below said chute;

a pair of parallel rails, one disposed on one side of said chute and the other disposed on the opposite side of said chute, said parallel rails having recesses formed at first and second positions thereof;

rollers for rolling along said parallel rails;

a mount base coupled to said rollers and being movable along said parallel rails via said rollers, said timing hopper being mounted on said mount base; and

a driver mechanism, provided on said mount base, for driving said timing hopper during the receiving and discharging operations;

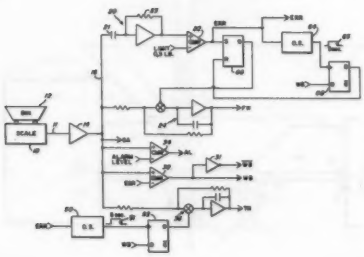
when said mount base is positioned by engagement of said rollers in the recesses formed in said parallel rails at the first position thereof, said timing hopper receives the articles discharged from said chute and, in response to operation of said driver mechanism, is opened to discharge the articles into the packing machine, and when said mount base is positioned by engagement of said rollers in the recesses formed in said parallel rails at the second position thereof, said timing hopper is in a state where cleaning is possible.

4,531,599

METHOD AND APPARATUS FOR WEIGHING WASTE SIGNATURES FROM A PRINTING PRESS

R. Langdon Wales, Moccasin Hill, Lincoln, Mass. 01773, and H. W. Crowley, 310 Parker, Newton, Mass. 02159

Filed Aug. 1, 1983, Ser. No. 519,001
Int. Cl.³ G01G *13/14*
U.S. Cl. 177—165 **17 Claims**



1. Apparatus for weighing waste signatures in a waste bin and taken from a printing press or the like comprising:

scale means for providing an electrical signal representative of cumulative weight of waste signatures in the waste bin,

means for sensing movement of said waste bin onto the scale means to provide a control signal, and

means responsive to both said scale means signal and the control signal for automatically providing a signal of bin tare weight,

said means for sensing including differentiator means for detecting any appreciable change in sensed weight occasioned by movement of the waste bin onto the scale means,

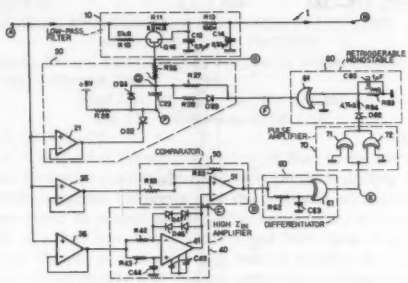
said control signal including a first signal that is indicative of erratic weight behavior as occurs when the waste bin is moved onto the scale means followed by a second signal generated by said means for automatically providing for holding the electrical scale signal that is present at the time the second signal is generated.

4,531,600

ELECTRICAL MEASUREMENT CIRCUIT INCLUDING A LOW-PASS FILTER, IN PARTICULAR FOR WEIGHING

Jacques F. Langlais, Coudray-Montceaux, and Gilbert C. Brisset, Paris, both of France, assignors to Testut-Aequitas, Paris, France

Filed Nov. 30, 1983, Ser. No. 556,316
Claims priority, application France, Dec. 2, 1982, 82 20201
Int. Cl.³ G01G *23/10, 3/14*
U.S. Cl. 177—185 **10 Claims**



1. An electronic measurement circuit including a low-pass filter, in particular for weighing, said circuit comprising an active input terminal, an active output terminal, a common terminal, and a two-port low-pass filter network connected between said terminals and including resistive components and reactive components, the improvement wherein the circuit comprises:

a link of controllable resistance connected in parallel with at least one of said resistive components;

discriminator means responsive to an input signal on said active input terminal to provide an on/off type signal following variations in the DC component of said signal present at said active input terminal, the pulse width of said on/off signal increasing with increasing amplitude in the variation of said DC component;

delay means for defining a "neutral" time interval of predetermined duration following the beginning of a pulse in said on/off signal; and

control means for controlling said link of controllable resistance in such a manner as to switch in a low value of resistance at the end of said neutral time interval and to progressively increase said controllable value of resistance to a high value following the end of a pulse in said on/off signal.

4,531,601

DEVICE FOR CORRECTING DEVIATIONS FROM RECTILINEAR MOVEMENT OF TRACKED VEHICLES HAVING SEPARATE TRANSMISSIONS FOR RIGHT AND LEFT SIDE TRACKS

Rino O. Barbagli, Borgaretto, Italy, assignor to Fiatallis Europe, S.p.A., Lecce, Italy

Filed Jun. 20, 1983, Ser. No. 506,117
Claims priority, application Italy, Aug. 17, 1982, 68022 A/82
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.48 **5 Claims**

1. Hydraulic transmission system for tracked vehicles, including:

two separate hydrostatic transmission for driving the right hand and left hand tracks of the vehicle, each including a variable-displacement hydraulic pump provided with hydraulically-operated control means for varying the pump displacement,

a hydraulic pilot pump,

a lever control device for controlling the speed of the vehi-

cle, said device being interposed between the pilot pump and said control means for the pumps of the two hydrostatic transmissions and being arranged to provide at its output, for each position of its control lever corresponding to a predetermined speed of the vehicle, a constant pressure which is less than the output pressure of the pilot pump,

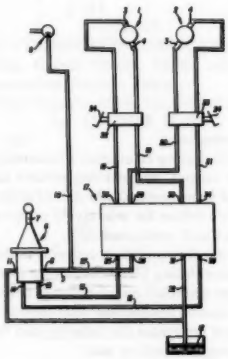
a pressure regulating device which is interposed in the connection between the speed control device and said control means for the pumps of the two hydrostatic transmissions, and is arranged to increase and to reduce the pressure supplied to the control means of one of said pumps so as to maintain the speeds of the two tracks equal,

said pressure regulating device characterized by

a first input communicating with the output of the speed control device,

a second input communicating with the output of said pilot pump,

an output communicating with the control means associated with the pump of one of the two hydrostatic transmissions,



a further output communicating with a discharge tank,

a duct connecting said first input to said first output and including a constriction,

a main chamber communicating with said duct downstream of the constriction,

a slide valve member having a first operative end position in which the main chamber communicates with the second input, a second operative end position in which the main chamber communicates with said further output, and a neutral central position,

two control members arranged to act on the two ends of the slide valve member respectively to urge it towards one or other of its two operative end positions,

two springs interposed between a respective ones of the control members and the corresponding end of the slide valve member,

first and second end chambers adjacent respective ones of the two ends of the slide valve member, the first end chamber communicating with the main chamber, the second end chamber communicating with said first input.

4,531,602

POWER STEERING SYSTEM

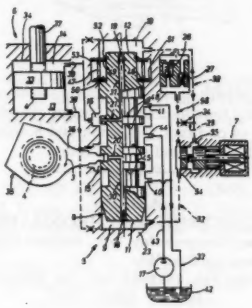
Arno Roehringer, Ditzingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,196

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225053; Dec. 23, 1982, 3247745

Int. Cl.³ B62D 5/08

U.S. Cl. 180—143 **23 Claims**



1. Power steering system comprising:

steering servo-motor means having a pair of oppositely disposed working chambers communicating fluid pressure to respective pressure surfaces of steering assist piston means;

servo-valve means movable in response to the wheel angle position of a hand steering wheel and including means for controlling the supply of fluid pressure to the respective pressure surfaces of the steering assist piston means, said servo-valve means including a movable valve adjusting member and a pair of reaction pressure chambers disposed to apply reaction pressure against the respective movement direction of the valve adjusting member;

respective first and second pressure connections between the respective reaction pressure chambers and the working chambers of the steering assist piston means for communicating reaction pressures back to the steering piston assist means;

a short-circuit pressure connection between the two reaction pressure chambers; and

modulating valve means for modulating the reaction pressure communicated to the working chambers by the first and second pressure connections;

wherein the first and second pressure connections are continuously open and are provided with respective first and second constant throttle means; and

wherein the modulating valve means is connected into the short-circuit pressure connection.

4,531,603

RACK AND PINION STEERING GEAR WITH ADJUSTABLE LOW FRICTION ANTI-ROLL RACK BEARING

Kenneth L. VanCise, Jr., Bay City, Mich., assignor to General Motors Corporation, Detroit, Mich.

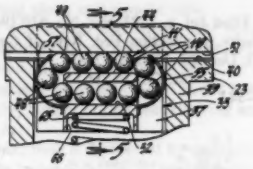
Filed Jan. 9, 1984, Ser. No. 569,184

Int. Cl.³ B62D 5/06

U.S. Cl. 180—148 **3 Claims**

1. A rack and pinion steering gear for steering the dirigible wheels of a vehicle comprising a rotatable pinion gear adapted to be rotated by a steering wheel of a vehicle, said pinion gear having a plurality of gear teeth forming the outer periphery thereof, an elongated rack having a series of gear teeth thereon in meshing engagement with the teeth of said pinion gear, said rack being longitudinally movable in response to rotation of

said pinion gear, a stationary housing for said longitudinally movable rack and for said rotatable pinion gear, a bearing in said housing for slidably supporting said rack therein, a recirculating train of balls operatively interposed between said rack and said bearing to reduce sliding friction therebetween while inhibiting roll of said rack relative in said housing in response to torque loads urging said rack to rotate.



4,531,604

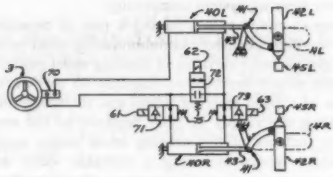
HYDRAULIC STEERING SYNCHRONIZATION SYSTEM

Gerald P. Lamer, Sturgeon Bay, Wis., assignor to Marine Travelift, Inc., Sturgeon Bay, Wis.

Filed Feb. 16, 1984, Ser. No. 580,668

Int. Cl.³ H04M *1/04*

U.S. Cl. 180—152 **5 Claims**



1. A synchronization system for automatically aligning the steerable wheels of a straddle-type hoist wherein steering is effected by movement of a pair of steerable wheels which are pivotal relative to the hoist frame and the pivotal movement of which is controlled by actuation of hydraulic cylinders secured to the hoist frame and operatively connected to each of the steering wheels, the synchronization system comprising

at least left and right hydraulic fluid actuated cylinders, each of said cylinders having a first portion secured to the frame of a straddle hoist and having a second portion movable relative to the hoist frame upon actuation of said cylinder in response to pressurized hydraulic fluid coupled thereto,

pump means for providing a source of pressurized hydraulic fluid coupled in fluid communication with each of said hydraulic fluid-actuated cylinders to effect the movement of said second portion thereof,

at least left and right linkage means respectively mutually exclusively operatively connected to said second portion of said left and right hydraulic fluid-actuated cylinders, and to the left and right steering wheels of the straddle hoist to effect pivotal movement of the steering wheel to which said linkage means is operatively connected relative to the straddle hoist upon movement of said second portion of the hydraulic cylinder to which said linkage means is operatively connected,

at least left and right switch means respectively mutually exclusively carried upon a portion of the straddle crane in a position to be actuated by the positioning of the left and right steering wheel in a position for straight ahead movement of the straddle hoist, and

valve means coupled in fluid communication between said pump means and said left and right hydraulic fluid-actuated cylinders for selectively controlling the pressurized hydraulic fluid coupled thereto in response to control signals applied to said valve means upon the actuation of said left and right switch means.

4,531,605

ARRANGEMENT FOR DRIVING THE GENERATOR OF A VEHICLE, IN PARTICULAR A PASSENGER AUTOMOBILE

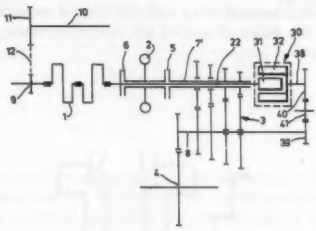
Romanus Scholz; Paulus Heidemeyer, and Peter Hofbauer, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 144,566, Apr. 28, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,557

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916816

Int. Cl.³ B60K *9/00*

U.S. Cl. 180—165 **5 Claims**



1. A vehicle comprising:

a vehicle drive including an engine, a transmission having an input and an output, and driving wheels coupled to the output of said transmission, said drive further including at least one clutch means for selectively coupling said engine to the input of said transmission;

a generator, solely for providing current, including first and second counterrotating members having means responsive to the rotation of either member for generating current;

first coupling means connecting said engine and the first member of said generator for rotating said first member in response to engine rotation; and

second coupling means connecting said driving wheels and the second member of said generator for rotating said second member in response to rotation of said driving wheels or said engine, wherein said vehicle can assume at least a first operating state in which said engine rotates and said clutch means is disengaged while said driving wheels are stopped, and a second operating state in which said engine rotation is stopped and said clutch means is disengaged while said driving wheels are rotating, and wherein said generator is driven if either said engine or driving wheels, or both, are rotating so as to be driven in both of said vehicle operating states.

4,531,606

AIR CLEANER FOR THREE WHEEL VEHICLE

Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Jan. 4, 1983, Ser. No. 455,582

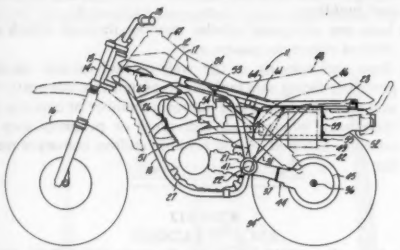
Claims priority, application Japan, Feb. 6, 1982, 57-16973; Feb. 16, 1982, 57-23368

Int. Cl.³ B60K *13/02*; B62D *61/08*

U.S. Cl. 180—210 **15 Claims**

1. In an induction system for a vehicle having frame means, at least one front wheel dirigibly supported by said frame means, a pair of transversely spaced apart rear wheels supported by said frame means, a body supported at least in part over said frame means, an engine, means for driving said rear wheels from said engine, and an induction system for said

engine comprising an air cleaner housing and an air filter element contained within said air cleaner housing, the improvement comprising said air cleaner housing being disposed rearwardly of said engine and between said rear wheels and



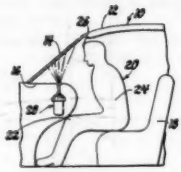
having a removable portion for providing access to said air filter element for servicing, said removable portion being located for direct access to said air filter element without removal or movement of any other component of said vehicle.

4,531,607

VEHICLE WINDSHIELD LUBRICATION SYSTEM

Alan L. Browne, Grosse Pointe, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1984, Ser. No. 615,915
Int. Cl.³ B60R *21/08*
U.S. Cl. 180—282 **2 Claims**



1. In combination with a vehicle including a windshield and an occupant seated in the vehicle adjacent the inner surface of the windshield, a vehicle body windshield lubrication system comprising a source of lubricant, means operable to sense an impact of the vehicle with an obstacle exceeding a predetermined level, and means actuated by the sensing means for applying a coating of lubricant from the source to the inner surface of the windshield within a predetermined time after initiation of vehicle impact and prior to any contact of the head of the occupant with such inner surface of the windshield.

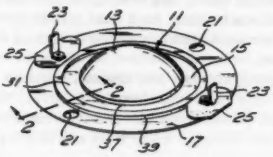
4,531,608

HIGH FREQUENCY COMPRESSION DRIVER

Harro K. Heinz, 27342 Via Amistoso, Mission Viejo, Calif. 92692

Filed Oct. 29, 1982, Ser. No. 437,515
Int. Cl.³ G10K *13/00*
U.S. Cl. 181—172 **15 Claims**

1. An acoustic device, comprising:
a diaphragm comprising:
a dome portion; and
an annular rim portion;
means for permitting axial movement of the dome portion of the diaphragm and for substantially preventing radial movement of the rim portion of the diaphragm; and
a step portion of the diaphragm, between the rim portion and the dome portion to permit controlled radial movement of the dome;



reinforcing means coupled to said dome portion and to said step portion to prevent the formation of localized stress points along said step portion as the dome is driven.

4,531,609

SOUND ABSORPTION PANEL

Jerry M. Wolf, Westerville, and Wilbur D. Holben, Ostrander, both of Ohio, assignors to Midwest Acounst-A-Fiber, Ostrander, Ohio

Continuation-in-part of Ser. No. 526,894, Aug. 6, 1983, Pat. No. 4,496,024. This application Jun. 22, 1984, Ser. No. 623,109
Int. Cl.³ E04B *1/82, 2/02*
U.S. Cl. 181—290 **2 Claims**

1. A sound absorbing panel comprising first and second layers of fiberglass partially in contact,
the first layer being formed into a sawtooth shape,
the second layer being flat on one side and having parallel grooves impressed into the other side,
the two layers being assembled with the teeth of the first layer resting in and bonded to the grooves in the second layer,
the fiberglass of the second layer intermediate the grooves is of less density than (1) the fiberglass at its grooves and (2) the fiberglass of the first layer,
the fiberglass of the second layer intermediate the grooves fluffs up to fill part of the cavities formed by the sawtooth shape intermediate the grooves,
a fabric layer bonded to and conforming to the sawtooth surface of the first layer on the surface facing away from the second layer.

4,531,610

DEVICE ENABLING A LOAD TO BE BRAKED AND/OR HELD, NOTABLY AN ANTI-FALL SAFETY DEVICE

Marcel Fertier, Fontaine, and Bernard G. Cuny, Saint Nuzier d'Uriage, both of France, assignors to Games, Uriage, France

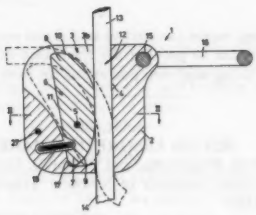
Filed May 7, 1982, Ser. No. 376,118
Claims priority, application France, May 8, 1981, 81 09234
Int. Cl.³ A62B *1/14*
U.S. Cl. 182—5 **8 Claims**

1. An anti-fall safety device for use with a rope enabling a load such as a person to be braked by friction against the rope and to be held by pinching the rope, comprising
a body having attachment means for securing said body to something else, and having a rope-receiving channel, one wall of which forms a bearing surface along which the rope extends,
a rope engaging lever pivoted to said body and having a first lever arm at one end and a second lever arm at its opposite end, said rope engaging lever extending along opposite

said bearing surface, and defining with it said rope receiving channel,

said first and second lever arms each having a cam-shaped outer profile facing said bearing surface and extending in line with each other, each said profile having a radius which increases with increasing length of its respective lever arm,

a rope passing through said channel between said bearing surface and said rope-engaging lever, acting when stretched, on said second lever arm to cause it to swivel in a direction moving it away from said bearing surface and



thereby causing said first lever arm to swivel towards said bearing surface,

said rope-engaging lever being fitted onto said body in such a way that the rope, when not stretched, is slightly pressed between said rope-engaging lever and said bearing surface and in engagement with the zone of the smallest radii of said cam-shaped outer profiles, and the rope, when stretched, rests in continuous contact with said cam-shaped outer profiles of said first and second lever arms towards the ends thereof and the cam-shaped outer profile of the first lever arm presses and pinches the rope against said bearing surface.

4,531,611

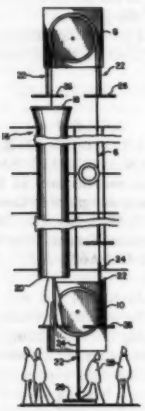
BUILDING EVACUATION SYSTEM AND ASSOCIATED METHOD

Yoram Curiel, 1956 S. Nome, Aurora, Colo. 80014

Filed Jan. 24, 1984, Ser. No. 573,359

Int. Cl.³ A62B *1/00*

U.S. Cl. 182—44 **29 Claims**



1. A building evacuation or entry system comprising an endless conveyor member,

a plurality of platform members secured to said conveyor member,

upper and lower support means for supporting said endless conveyor member and permitting orbital movement thereof in a path generally parallel to an adjacent wall of said building,

at least one elongated tubular member through which said endless conveyor passes, and

at least one opening in the wall of said tubular member generally facing said building to permit evacuee entry into said tube and onto a said platform member or evacuee exit thereform, whereby an individual or property may be raised or lowered by said orbiting endless conveyor member.

4,531,612

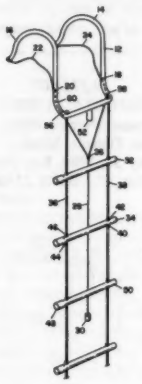
ESCAPE LADDER

Jules A. Sandor, 12012 Bambi Pl., Granada Hills, Calif. 91344

Filed Sep. 17, 1984, Ser. No. 651,478

Int. Cl.³ E06C *1/56, 7/08*

U.S. Cl. 182—196 **9 Claims**



1. An emergency fire-resistant escape ladder comprising hooking means to engage the ladder over a wall or ledge, a plurality of steps larger in diameter at one end and adapted to interlock by fitting the smaller end into the larger end of the adjacent step, the steps held together by a pair of cables, a release cable attached to the hooking means adapted to release the hooking means from the ledge.

4,531,613

FIREFIGHTER'S LADDER

William T. Keigher, 313 Fairlane Dr., Joliet, Ill. 60435

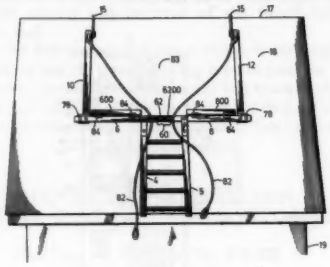
Filed Apr. 23, 1984, Ser. No. 603,252

Int. Cl.³ E06C *7/48, 1/08*

U.S. Cl. 182—206 **14 Claims**

1. A ladder comprising a lower section and an upper section, said upper section including a first side rail along one side of said ladder and a second side rail along the other side of said ladder, expanding means to move said first and second side rails between a first position wherein they are relatively close together and a second position wherein they are farther apart, including an unobstructed clearance zone between said first and second side rails when in said second position, wherein said lower section of said ladder includes a first lower section side rail along one side of said ladder and a second lower section side rail along the other side of said ladder, said expanding means including pivot connecting means to pivotally connect said first lower section side rail to said first side rail of said upper section and to pivotally connect said second lower

section side rail to said second side rail of said upper section, including a first platform rail hingedly connected to said first intermediate rail and pivotable between a position overlapping said first intermediate rail and a position alongside said first intermediate rail, and a second platform rail hingedly connected to said second intermediate rail and pivotable between



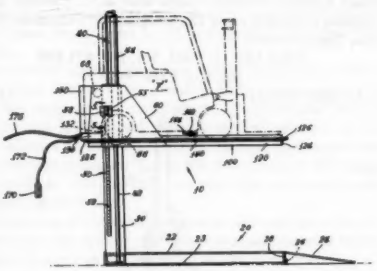
a position overlapping said second intermediate rail and a position alongside said second intermediate rail, said intermediate rails being pivotable to a horizontal position when said lower section side rails are vertical, said platform rails being pivoted to said alongside position for use as a platform for a workman when said intermediate rails are in said horizontal position.

4,531,614

FORK TRUCK SERVICE LIFT

Robert W. Naegeli, Edmond, Okla., assignor to Autoquip Corporation, Guthrie, Okla.

Filed Jul. 25, 1983, Ser. No. 516,875
Int. Cl.³ B66F 7/16
U.S. Cl. 187—8.5 **12 Claims**



12. A portable service lift for elevating equipment such as industrial vehicles comprising:

a base assembly for supporting said lift in a movable manner at one location and for allowing the lift to be readily moved to another location, said base assembly including a base platform having a selected length and width and onto which the equipment to be elevated can be driven;

a pair of support legs joined to and extending upwardly from said base platform, said legs being transversely spaced and disposed at opposite sides of one end of said platform to define a substantial opening therebetween for receiving a portion of the equipment to be elevated;

a pair of elongated lifting arms positioned on the outside of said opposite sides of said platform, each arm having a rear end adjacent one of said support legs and extending forwardly along a side of said platform so that equipment placed on said platform is positioned between said arms and the area beneath said arms when lifted is totally unobstructed in a direction trnasversely across said platform;

means for movably joining each lifting arm in cantilevered fashion to the adjacent support leg including support means rigidly joined to each arm adjacent said rear end and extending upwardly adjacent the associated support leg; first roller means rotatably mounted on said support means in rolling engagement with a front face on the associated support leg; and second roller means rotatably mounted on said support means in rolling engagement with an opposing rear face on the associated support leg and spaced vertically a selected distance from said first roller means; whereby said first and second roller means continuously support said cantilevered lifting arms on said support legs as said arms are raised or lowered with respect to said base platform;

first lifting bar means extending transversely across the rear ends of said lifting arms in a position to extend beneath one portion of said equipment to be lifted as said equipment is moved onto said base platform;

second lifting means having a length selected to extend across said lifting arms beneath another portion of said equipment stationed on said base platform, whereby said first and second lifting bar means engage with and support spaced portions of said equipment as said lifting arms are raised with respect to said base platform; and

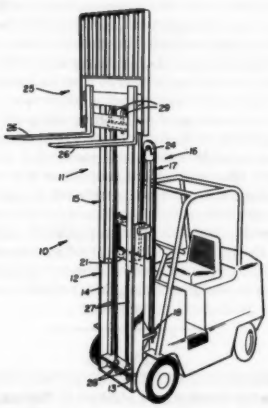
lifting means operably associated between the rear ends of said lifting arms and said support legs for raising and lowering said arms along said support legs to raise and lower said equipment supported between said arms.

4,531,615

HIGH-VISIBILITY MAST ASSEMBLY FOR LIFT TRUCKS

John E. Wible, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US82/00869, § 371 Date Jun. 25, 1982, § 102(e) Date Jun. 25, 1982, PCT Pub. No. WO84/00149, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 25, 1982, Ser. No. 433,471
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 E **14 Claims**



1. A lift truck (10) mast assembly (11) comprising

a fixed upright assembly (12) having laterally-spaced uprights (13, 14) adapted for mounting on a lift truck (10),

a moveable upright assembly (15) sideably mounted on said fixed upright assembly (12),

at least one chain (17) secured at opposite end portions thereof to said fixed upright assembly (12),

a pair of laterally spaced chain guides (20) mounted on a lower end portion of said moveable upright assembly (15) and having said chain (17) entrained thereunder to form a pair of vertically disposed and laterally-spaced chain portions (17*a*, 17*b*), and

actuating means (22) engaging said chain (17) between one end of said chain (17) and said chain guides (20) for selectively raising said moveable upright assembly (15) on said fixed upright assembly (12) in response to extension of said actuating means (22) and for lowering said moveable upright assembly (15) on said fixed upright assembly (12) in response to retraction of said actuating means (22).

4,531,616

ELEVATOR CONTROL SYSTEM

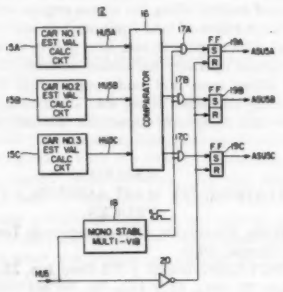
Kenichi Uetani, Nishi Kasugai County, and Yasukazu Umeda, Kasugai, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,194

Claims priority, application Japan, Nov. 1, 1982, 57-192126

Int. Cl.³ B66B *1/18*

U.S. Cl. 187—29 R **9 Claims**



1. An elevator control system for selecting from amoung a plurality of elevator cars put under the group supervision one elevator car most suitable for responding to a floor call registered on the basis of information required for the group supervision and assigning said selected elevator car to said floor call, which system comprises a calculating means for predicting a car suspending time interval due to a car call and a floor call at each floor served by said plurality of elevator car in accordance with a percentage of passenger getting-off or -on preliminarily prepared in each direction of travel of the elevator car with respect to each floor, and a means for calculating presumed arrival time intervals at each floor in consideration of said suspending time interval predicted by said calculating means; wherein said calculating means for predicting the suspending time interval calculates a predicted suspending time interval on the basis of the number of getting-off passengers calculated from passengers within the elevator car which has increased due to non-responding floor calls in accordance with a percentage getting-off at each floor.

4,531,617

OVERSPEED SAFETY BRAKING DEVICE

Derek J. Martin, Standon, and Michael D. Barker, Hunsdon Nr. Ware, both of England, assignors to D. Wickham and Company Limited, Hertfordshire, England

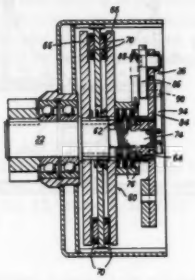
Continuation of Ser. No. 252,708, Apr. 9, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 550,503

Claims priority, application United Kingdom, Apr. 10, 1980, 8011881

Int. Cl.³ B66B *5/16*

U.S. Cl. 187—89 **27 Claims**

1. An overspeed safety braking device comprising an input shaft, the speed of which is to be braked when it succeeds a limit value, a rotary friction brake having a fixed part and a rotary part, the input shaft being permanently coupled for rotation with the rotating part of the rotary friction brake; a control device for applying the brake; and centrifugal activating means for activating said control device, said centrifugal actuating means comprising a support member which rotates with the input shaft when the speed is below the limit value, a



weight pivotally mounted on said support member, an overcenter biasing means coupled between said weight and said support member, said biasing means being arranged to bias the weight toward the axis of rotation of the shaft until the speed has exceeded the limit value and to bias the weight away from the axis of rotation after the speed has exceeded the limit value, thereby irreversibly applying the brake so that even when the speed of the shaft is slowed down below the limit value, the overcenter biasing means remains in an overcenter position.

4,531,618

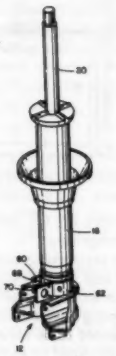
INTERCHANGEABLE STRUT BODY

Michael Kobiske; William Voigt, both of St. Charles, and Kris Sharma, Lombard, all of Ill., assignors to Maremont Corporation, Carol Stream, Ill.

Filed Mar. 2, 1983, Ser. No. 471,509

Int. Cl.³ F16F *9/32*

U.S. Cl. 188—321.11 **12 Claims**



1. A vehicle suspension strut member for receiving and securing a functional line comprising:

a tubular strut outer cylinder having an exterior;

a functional line bracket on the cylinder exterior including an arcuate central portion fitted to the cylinder exterior and extending circumferentially about a portion of the strut outer cylinder, and

a first end portion attached to the arcuate central portion and extending outward away from the cylinder exterior a non-interfering distance;

a second end portion attached to the arcuate central portion opposite the first end portion and extending outward away from the cylinder exterior the non-interfering distance;

a functional line bracket plate adapted to be received by the first and second end portions of the functional line bracket; and

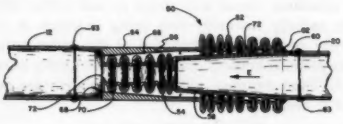
means on the first and second end portions of the functional line bracket and the functional line bracket plate for interchangeably mounting the functional line bracket plate to the first end portion of the functional line bracket and to the second end portion of the functional line bracket.

4,531,619

COLLAPSIBLE STEERING COLUMN

Robert E. Eckels, 49 S. Lookout Mountain Rd., Golden, Colo. 80401

Filed Sep. 24, 1982, Ser. No. 423,220
Int. Cl.³ B60T *11/00*
U.S. Cl. 188—371 **11 Claims**



1. An energy-absorbing device for mounting in an elongated member for absorbing the forces applied to either end of the member, the device comprising:

(a) a first energy-absorbing means having a first bellow section and a first elongated tubular support section axially aligned and connected thereto;

(b) a second energy absorbing means having a second bellow section and a second elongated tubular support section axially aligned and connected thereto, said second absorbing means being sized to fit within said first absorbing means;

(c) both of said energy absorbing means being connected to each other at their corresponding ends and arranged with the first support section adjacent to the second bellows section and said second support section adjacent to said first bellows section whereby as the first and second bellows section collapses due to the absorption of the energy they will at least partially contact the adjacent tubular support section; and

(d) at least one of the tubular support sections has a longitudinal taper, the diameter at one end of said tapered section being the same as the diameter of the corresponding surface of the bellows section wherein the collapsing of the bellows section during the application of energy will cause a progressive contacting between the bellows section and the tapered support section causing a continuously changing energy absorption rate for the progressive collapse of the bellows section.

4,531,620

FREEWHEEL RAMP/ROLLER CLUTCH WITH POSITIVE LOCK-OUT

Robert A. Stone, Sandy Hook, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 21, 1983, Ser. No. 554,145
Int. Cl.³ F16D *3/34*
U.S. Cl. 192—45 **1 Claim**

1. A ramp/roller freewheeling clutch comprising:

a driven member having a cylindrical driving surface;

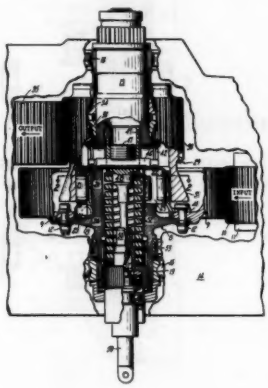
a plurality of rollers disposed adjacent said driving surface;

a generally cylindrical driving member disposed radially inward of said rollers and having a recess in its peripheral surface respectively corresponding to each of said rollers, a ramp surface corresponding to each of said recesses and extending from the corresponding recess to the next adjacent recess, each of said ramp surfaces being increasingly radially outward as it extends from the corresponding recess;

means for rotating said driving member in a driving direction;

a primary cage having a plurality of apertures therein, each aperture corresponding to one of said rollers, said primary cage being disposed between said driven member and said driving member and adapted to position each of said rollers at a like position with respect to the corresponding recess and ramp;

means for urging said primary cage in a direction with respect to said driving member so as to cause said rollers to be moved upwardly on the corresponding ramp surfaces,



said ramp surfaces being spaced from said driving surface such that motion of the driving member in said driving direction causes said rollers to become wedged between said ramp surfaces and said driving surface;

a secondary cage disposed in fixed relationship with said driving member between said driving member and said driving surface of said driven member, said secondary cage having a plurality of spaced apart bars defining apertures through which said rollers may contact said driving surface of said driven member, characterized by:

said secondary cage comprising ramp surfaces on said bars disposed so that motion of said primary cage with respect to said driving member in said driving direction will cause said rollers to engage said ramp surfaces on said bars and will be forced radially inwardly from said driving surface of said driven member; and

means actuable to drive said primary cage relative to said driving member in said driving member in said driving direction of said driving member.

4,531,621

FLOW CONTROL VALVE FOR FLUID FAN DRIVE

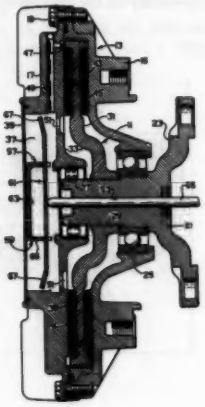
Michael E. Hazel, Bellevue, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 27, 1983, Ser. No. 565,549
Int. Cl.³ F16D *35/00*
U.S. Cl. 192—58 B **7 Claims**

1. A fluid coupling device of the type including a first rotatable coupling member defining an axis of rotation, cover means associated with said first member, to define a fluid chamber therebetween, valve means including a wall member disposed to separate said fluid chamber into a fluid operating chamber

and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first coupling member, one of said coupling members receiving a rotary torque input by means of an input shaft, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber and including said wall member defining a fluid inlet port and a valve member disposed in said fluid reservoir chamber, actuation means operable to move at least a portion of said valve member in an axial direction in response to an input signal; characterized by:

(a) said actuation means including an actuating member disposed to move within an opening in said input shaft, along said axis of rotation, from a normal position forwardly toward said cover means when said input signal indicates a need to operate said fluid coupling device in a disengaged mode;



(b) one of said valve means and said cover means defining first and second fulcrum points, disposed diametrically oppositely about said axis of rotation;

(c) said valve member comprising an elongated, generally flat member normally disposed in engagement with said first and second fulcrum points and including a central portion disposed between said fulcrum points, said actuating member being in engagement with said central portion of said valve member; and

(d) said valve member including a pair of terminal portions, one of which is disposed to be spaced axially forwardly of said fluid inlet port when said actuating member is in said normal position, whereby movement of said actuating member toward said cover means results in corresponding movement of said central portion of said valve member and rearward movement of said one of said terminal portions to a position blocking substantial flow of fluid through said inlet port.

4,531,622

CLUTCH MECHANISM FOR AUTOMOBILE VEHICLES

Michel Bacher, Garges-les-Gonesse, and Dominique Despres, Clichy, both of France, assignors to Valeo, Paris, France

Filed Jun. 18, 1982, Ser. No. 389,768

Claims priority, application France, Jun. 19, 1981, 81 12094

Int. Cl.[3] **F16D** *13/70*

U.S. Cl. 192—70.18 **10 Claims**

1. A clutch mechanism for a motor vehicle, comprising a generally annular cover; an annular pressure plate; a plurality of resiliently deformable straps each comprising one or more leaf springs and connecting said pressure plate to said cover for rotation therewith; said straps allowing axial displacement of said pressure plate with respect to said cover; fixing means attaching one of the ends of each of said straps to said cover and the other of the ends to said pressure plate; axially acting resilient means bearing against said cover and operable to urge said pressure plate axially away from said cover; and stop means adapted to limit axial travel of said pressure plate to a predetermined distance away from said cover, said stop means

including at least one lug fixed to said cover by said fixing means attaching one of said straps to said cover, said lug extending radially inwardly and being engaged in a radially outwardly opening slot provided at the outer periphery of pressure plate, a shoulder limiting said slot axially adjacent said cover for axial abutment with said lug in a storage position of the clutch mechanism.

4,531,623

SHIFT FORK IN A TRANSMISSION FOR AN AUTOMOBILE INCLUDING PAWL MEMBERS WITH STEPPED OUTER PORTIONS

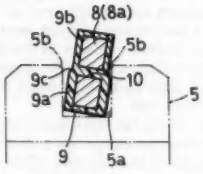
Hajime Arai, Aichi; Shozi Haga, and Tadashi Nozaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 7, 1982, Ser. No. 396,115

Claims priority, application Japan, Aug. 8, 1981, 56-117933[U]

Int. Cl.[3] **G05G** *3/00, 9/12;* **F16D** *11/10*

U.S. Cl. 192—82 R **1 Claim**



1. A shift fork in a transmission for an automobile comprising:

a fork body having a steel plate member with substantially planar free ends defining a fork, said fork body being supported by a fork shaft, said free ends engaging an annular groove defined along an outer circumference of a hub sleeve carried in a clutch mechanism for said transmission, each free end having a stopper hole extending therethrough; and

a pawl member formed of resin fixed to each free end of said fork body and covering the entire cross-sectional and circumferential extent of each free end of said fork body to protect the entire length of said free ends from said annular groove of said hub sleeve, each pawl member having a stopper member extending through the stopper hole in the corresponding free end for preventing said

pawl member from being withdrawn from said corresponding free end, a thick portion for engaging said annular groove, a thin portion disposed partially within and extending above said annular groove, and a transitional portion bridging said thick and thin portions, said transitional portion being positioned substantially entirely within said annular groove;

each transitional portion maintaining a gap between said thin portion and said annular groove during shift operations to prevent contact between said thin portion of said pawl member and said annular groove of said hub sleeve, thereby to protect said thin portion.

4,531,624

CHECK VALVE USED WITH VACUUM SYSTEM FOR AN AUTOMOTIVE VEHICLE

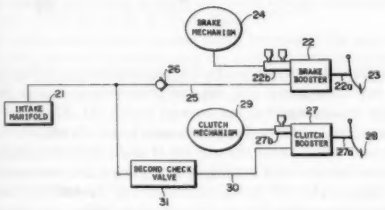
Yasufumi Ideta, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 17, 1981, Ser. No. 274,405

Claims priority, application Japan, Oct. 7, 1980, 55-143126[U]

Int. Cl.³ B60T *13/48*

U.S. Cl. 192—0.094 **7 Claims**



1. A vacuum system for an automotive vehicle which avoids the use of a conventional vacuum tank, and which comprises:

(a) a vacuum generator for generating a negative pressure to actuate the system while the vehicle is travelling;

(b) a brake mechanism for applying a brake force to the vehicle;

(c) a vacuum brake booster actuated by a brake pedal for actuating said brake mechanism according to a difference between negative pressure introduced from said vacuum generator and atmospheric pressure introduced from the outside when said brake pedal is depressed;

(d) a first check valve for passing air from said vacuum brake booster to said vacuum generator when a vacuum is generated by said vacuum generator and for stopping air from flowing from said vacuum generator to said vacuum brake booster, said first check valve being connected between said vacuum brake booster and said vacuum generator;

(e) an actuator mechanism for applying an actuating force to the vehicle;

(f) a vacuum actuator actuated by an actuator pedal for actuating said actuator mechanism according to a difference between negative pressure introduced from said vacuum generator and atmospheric pressure introduced from the outside when said actuator pedal is depressed; and

(g) a second check valve connected directly to said vacuum actuator and located between said vacuum actuator and said vacuum generator in parallel with said first check valve, there being no vacuum-generating means between said second check valve and said vacuum actuator, which second check valve comprises:

(1) a valve body having a valve chamber, a first valve opening to communicate with said vacuum actuator, and a second valve opening to communicate with said vacuum generator;

(2) a coil spring housed within said valve body; and

(3) a poppet valve having a first spherical surface and a second spherical surface, said poppet valve being provided with an orifice formed therein so as to communicate between the valve chamber and said vacuum generator, said poppet valve being urged against the first valve opening by the force of said coil spring, the first spherical surface being formed so as to close the first valve opening and the second spherical surface being formed so as to close the second valve opening,

whereby said second check valve functions like said first check valve in regulating the passage of air from said vacuum actuator to said vacuum generator when said vacuum system operates normally, but functions as an orifice in restricting said passage of air when said vacuum actuator operates defectively to introduce a substantial volume of air into said vacuum actuator in an abnormal state.

4,531,625

CIRCULAR OBJECT'S DIAMETER DETERMINING DEVICE

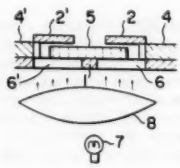
Kenichi Yonekura; Kazuto Asami; Yushi Hino, and Katsumi Yagi, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Jan. 25, 1983, Ser. No. 460,726

Claims priority, application Japan, Jan. 30, 1982, 57-13934

Int. Cl.³ G07D *5/02*

U.S. Cl. 194—102 **4 Claims**



1. A device for determining the diameter of a circular object moving down a passageway, said device comprising:

a pair of photo-electric converters protruding from both sides of a passageway down which circular objects move, said converters protruding towards the central line of said passageway, for simultaneously scanning from the central line of the passageway toward both sides of the passageway and producing a signal corresponding to the area of the portion of said converters shielded from light by the circular object;

a pair of light-shielded portion area measuring circuits for receiving outputs of said photo-electric converters and providing signals representing the areas of the portions of said converters being shielded from light by the circular object;

an addition circuit for summing the outputs of said pair of light-shielded portion area measuring circuits and providing a signal representing the sum thereof;

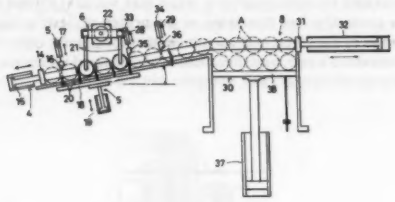
a maximum value memory circuit receiving the output of said addition circuit for storing the maximum output of said addition circuit provided while one circular object passes through said photo-electric converters; and

a determining circuit for determining the diameter of a circular object from the maximum output stored in said maximum value memory circuit.

4,531,626
PROCESS FOR DISTRIBUTING DISKS AND APPARATUS THEREFOR

Tetsuo Toriyabe; Kunihiko Ooya; Akira Nogami, and Kazunori Sugawara, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Toyko, Japan

Filed Jan. 13, 1983, Ser. No. 457,592
Claims priority, application Japan, Jan. 13, 1982, 57-2785
Int. Cl.³ B65G *49/00*
U.S. Cl. 198—347 **18 Claims**



17. An apparatus for distributing disks comprising:

slide cutter means for dividing a row of stacked disks being conveyed at a continuous constant speed at every predetermined number thereof, one after another, to form cylindrical stack bodies thereof;

a feeding means for storing a plurality of stacked bodies;

an inclined passage positioned adjacent to and extending at substantially a right angle with respect to the conveying direction of said stacked disks, said inclined passage including a lower portion and being inclined upwardly to a forward end, said inclined passage is an inclined table surface extending from said lower portion adjacent to said slide cutter to said forward end adjacent to said feeding means;

said slide cutter supplying every cylindrical stacked body one after another to said inclined passage;

push-up means for intermittently pushing upwards the cylindrical stacked bodies supplied one after another to the lower portion of the inclined passage, said push-up means includes a cylinder having a push-up rod operatively attached thereto for intermittently advancing rows of stacked bodies from said lower portion toward said feeding means;

said feeding means includes a housing having a lift means forming a bottom surface thereof for receiving a plurality of rows of stacked bodies;

holding means for holding upwardly moved one or more cylindrical stacked bodies at an upper stage position on the lower portion of the inclined passage;

distributing means for distributing at least two of the cylindrical stacked bodies arranged in a row and in mutual parallel relationship on the inclined passage to a side portion of the inclined passage; and

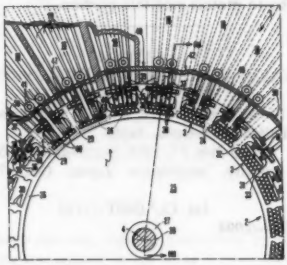
a cylinder having a push-out rod operatively connected thereto for selectively resupplying rows of stacked bodies positioned in said feeding means and returning the stacked bodies back to said inclined passage.

4,531,627
DEVICE FOR FORMING GROUPS OF CIGARETTES IN CIGARETTE PACKAGING MACHINES

Riccardo Mattei, and Gastone Dall'osso, both of Bologna, Italy, assignors to G.D. Societa Per Azioni, Bologna, Italy

Filed Jul. 13, 1983, Ser. No. 513,218
Claims priority, application Italy, Sep. 8, 1982, 3523 A/82
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—420 **7 Claims**

1. An improved device for forming groups (3) of cigarettes in cigarette packaging machines of the type comprising an outlet hopper (5) of a cigarette feed line, said hopper (5) having a plurality of outlet mouths (18); a forming wheel (2), along the periphery of which there are uniformly distributed axial containers (8) for said groups (3), each said container (8) being arranged to receive in succession several superposed layers (31, 32, 33) of cigarettes, each layer being fed in a direction axial to said wheel (2) from a respective said outlet mouth (18) by pusher means (24, 25) disposed in a position corresponding with a station (7) for loading said cigarettes on to said wheel; and retention means (34; 56) for maintaining said layers (31, 32, 33) in position inside the relative containers (8) during the

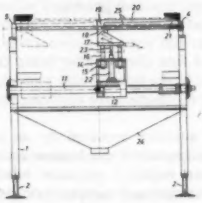


formation of said groups (3); the improvement residing in that said retention means (34; 56) comprise presser means (40; 55) which are arranged to act on said layers (31, 32, 33) of each group (3) in a direction radial to said wheel (2) and are mobile with said wheel about the axis (4) of said wheel at least during the traversing of said loading station (7) by said containers (8), cam means (42; 69) being provided for transmitting to said presser means (40; 55) oscillatory movements in a direction radial to said wheel (2) during the formation of said groups (3).

4,531,628
CONVEYANCE SYSTEM

Waldemar Glowatzki, Dofstr. 27, 3004 Isernhagen 2, Fed. Rep. of Germany

Continuation of Ser. No. 187,825, Sep. 15, 1980, abandoned. This application Jan. 5, 1984, Ser. No. 568,493
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1980, 3011875
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—432 **9 Claims**



1. In a roller conveyor device for transporting items, said roller conveyor device including sensing and control means for determining when said items are in a predetermined position relative to the roller conveyor device and for actuating operation of the roller conveyor device once the items are in the predetermined position, the improvement of said roller conveyor device by incorporating therein means for adjusting the conveyance velocity at which lateral rows of items are conveyed from a first conveyance velocity to a second conveyance velocity which is lower than the first conveyance velocity, comprising in combination:

(a) first rollers for receiving rows of items transported in a predetermined direction of conveyance at said first predetermined conveyance velocity;

(b) L-shaped arms, each said arm having at least one leg that runs essentially parallel to the first rollers and at least one second leg that runs transverse to the plane defined by the first rollers, said arms being mounted on a movable drive unit which is located underneath the first rollers, said movable drive unit being mounted, in turn, on guide rails that are substantially parallel to said first rollers, said movable drive unit defining means for cyclically moving said arms such that the one legs of the L-shaped arms from a start position are simultaneously lifted up through the first rollers to a predetermined height above the first rollers, then moved in a direction substantially parallel to the first rollers and away from their free ends over a distance according to their length, then lowered below the upper edge of the first rollers and then returned in this height to the start position underneath the first rollers and thereby lifting a first row of said items from said first roller means, then moving said first row of said items laterally with respect to the direction of conveyance of said rows of items over a distance according to the length of the first row and then lowering the first row of items onto the first roller means besides a second row of items having continued to be transported to and received by the first roller means in the meantime;

(c) said sensing and control means being located in the area of the L-shaped arms and actuating the said movable drive unit for the L-shaped arms in its start position once the conveyed objects have reached the predetermined location;

(d) second rollers located in the direction of conveyance from the first rollers for simultaneously receiving said first and second rows of items;

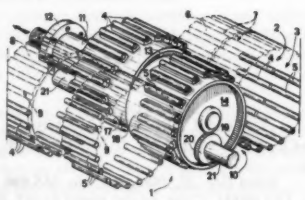
(e) the second rollers being coupled by a gearbox which adjusts the speed of the second rollers downward stepwise from roller to roller in the conveyance direction of the first rollers adjacent the L-shaped arms and so adjusting the said first conveyance velocity to said lower second conveyance velocity and thereby adjusting the spacing between the rows of items in the direction of conveyance.

4,531,629

AXIAL TRANSLATION DEVICE FOR PARTLY FINISHED CIGARETTES

Enzo Seragnoli; Riccardo Mattei, and Gastone Dall'Osso, all of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Mar. 7, 1983, Ser. No. 472,561
Claims priority, application Italy, Mar. 29, 1982, 48120 A/82
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—458 **6 Claims**



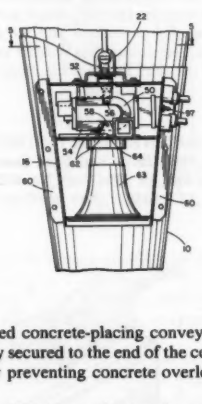
1. A device for axial translation of partly finished cigarettes (4,5) disposed alongside one another in such a way as to form two substantially parallel rows (2,3) movable in a direction of advance substantially perpendicular to the axes of the said partly finished cigarettes (4,5); the device including an input conveyor (6) and an output conveyor (8) for the said two rows of partly finished cigarettes (4,5) and axial translation means (10) for the said partly finished cigarettes (4,5) being provided between the said input conveyor (6) and output conveyor (8) to vary the distance between the said two rows (2,3); characterized by the fact that the said axial translation means (10) include two conveyor rollers (17,18) each operable to transport partly finished cigarettes (4,5) of a respective said row (2,3) and rotatable about respective axes (15,16) parallel to those of the said partly finished cigarettes (4,5) but offset from one another; each said roller (17,18) being substantially tangential to the said input and output conveyors (6,8) and carrying connected to their peripheries a plurality of supports (26,27) for the said partly finished cigarettes (4,5); the supports (26,27) being movable parallel to the axes of the said partly finished cigarettes (4,5) under the thrust of actuator means (40,41,42) between a take-up position and a release position, the said supports (26,27) for the said partly finished cigarettes (4,5) being distributed at constant pitch around the periphery of the said conveyor rollers (17,18), and with the distances along the periphery of these rollers lying between their points of tangency with the said input and output conveyors (6,8) and differing from one another by an amount equal to at least one pitch step, and the input conveyor (6), the output conveyor (8) and the conveyor rollers (17,18) all having the same pitch or distribution step and the distances along the periphery of the conveyor rollers (17,18) between the point of tangency with the input conveyor (6) and output conveyor (8) differing by an amount which is exactly equal to one pitch or distribution step or a multiple of this distance.

4,531,630

LOAD SENSOR

Robert F. Oury, Gilberts, and Charles J. Arndt, Elk Grove Village, both of Ill., assignors to Rotec Industries, Inc., Elmhurst, Ill.

Filed Jun. 29, 1983, Ser. No. 508,834
Int. Cl.³ G01G *11/08*
U.S. Cl. 198—505 **9 Claims**



1. In an elevated concrete-placing conveyor feeding into a tremie detachably secured to the end of the conveyor, a device for automatically preventing concrete overload in the tremie comprising

means interposed between the tremie and the end of the conveyor which distends as the weight of the tremie increases;

said means comprising a U-shaped beam having one leg thereof connecting through link means to the end of the conveyor and the other leg thereof connecting through link means to the tremie,

a first pair of opposed, spaced contacts mounted on said distending means connecting with a circuit to a first-alarm means and to a circuit supplying power to said conveyor,

a second pair of opposed, spaced contacts mounted on said distending means and connecting to a circuit which supplies power to means for detaching said tremie from said conveyor,

whereby as the weight of the tremie increases to a first predetermined quantity, the first pair of contacts engage to actuate the alarm and stop the conveyor, and as the weight to the

tremie increases to a second predetermined quantity, the second pair of contacts engage to detach the tremie.

4,531,631

CONVEYOR BELT

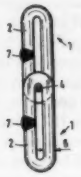
Rudolf Klefisch, Siebengebirgsallee 165, 5000 Cologne 41, Fed. Rep. of Germany

Filed Apr. 13, 1983, Ser. No. 484,678

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214009

Int. Cl.³ B65G *17/40*

U.S. Cl. 198—853 **3 Claims**



1. Conveyor belt formed from individual chain links which are arranged with their longitudinal extension in the longitudinal direction of the belt to form members parallel to and at a distance from one another, said chain links are formed from a piece of wire bent such that one end of the wire is adjacent to the other end of the wire with a gap between each end, the chain links of the adjacent members being inserted partially into one another and being hinged to one another by means of bars inserted through the aligned orifices, wherein the chain links forming the belt members are arranged in succession, transversally to the longitudinal direction of the belt, at a parallel distance from one another, which is somewhat greater than the thickness of a chain link, and are connected to one another by at least one continuous welded seam laid so that it closes the gap of the wire forming the chain link.

4,531,632

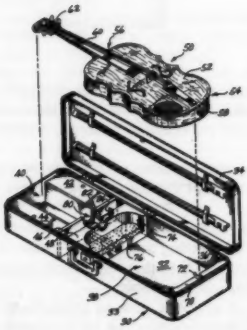
CASE FOR STRINGED INSTRUMENT

LeRoy D. Weber, 408 - 200th Ave. East, Sumner, Wash. 98390

Filed Apr. 19, 1984, Ser. No. 602,004

Int. Cl.³ A45C *11/00*; **B65D** *81/00*

U.S. Cl. 206—14 **4 Claims**



1. A protective case for a stringed instrument having a body and a neck with a fingerboard which comprises:

a. a generally rectangular outer carrying case;

b. a fixed contoured bearing wall located adjacent to one end of the carrying case, the wall adapted to generally conform to one end of an instrument body;

c. an adjustably moveable transverse bearing wall located within the central area of the case, said transverse wall having a cut-out section generally centered along the longitudinal axis of the case and adapted to receive and serve as a cradle for the instrument neck;

d. resilient transverse pad means located adjacent to and essentially at right angles to each bearing wall and adjacent to the bottom of the carrying case in order to act as bearing surfaces to support the back of the instrument body at each end so that the back of the body is out of contact with the bottom of the case, the pad means adjacent to the moveable wall being moveable with said wall, said moveable bearing wall being adapted for limited longitudinal adjustment in order to snugly hold instrument bodies of different lengths.

4,531,633

RELATING TO LATCH SECURITY DEVICES

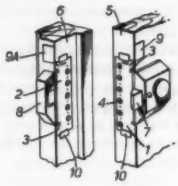
Leighton D. Evans, 50 Neath Rd., Maesteg, Glamorgan, United Kingdom

Filed Sep. 9, 1982, Ser. No. 416,957

Claims priority, application United Kingdom, Sep. 9, 1981, 8127296; May 28, 1982, 8215637; Jun. 8, 1982, 8216572; Jul. 31, 1982, 8222173

Int. Cl.³ B65D *69/00*

U.S. Cl. 206—230 **19 Claims**



1. A latch security kit comprising a pair of templates for positioning at predetermined positions respectively on a door and door jamb adjacent the door latch and staple, the templates indicating the positioning of studs to be affixed to the door and door jamb so that the studs will be mutually interspersed when the door is closed onto the jamb, and a set of studs to be inserted in the positions defined by the templates.

4,531,634

INSTANT VELCRO ASSEMBLY

Lai Jung-Chi, Rm. 8 9th Fl., No. 20 Min Chuan W. Rd., Taipei, Taiwan

Filed Dec. 27, 1983, Ser. No. 565,696

Int. Cl.³ B65H *37/04, 19/04*; **B65D** *85/67, 85/671*

U.S. Cl. 206—391 **2 Claims**

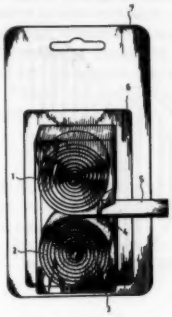
1. An instant VELCRO assembly comprising:

a rolled-up male tape, which is a part of the VELCRO with its adhering face facing outwards and being packed in one portion of a transparent plastic case;

a rolled-up female tape, which is a part of the VELCRO with its adhering face facing outwards and being packed in one portion of said transparent plastic case abreast with said male tape;

a transparent plastic case, which is moulded into shape and attached, with its edge, to a cardboard for housing said

male and female tapes, and which is also furnished with an outlet in the middle at one side, thru which the male and



female tapes are pressed together upon being pulled out; and

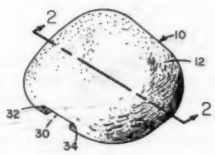
a cardboard, which is the base of this assembly.

4,531,635

HIDING PLACE FOR KEYS AND SIMILAR ARTICLES

George D. Cleveland, Long Lake, Minn., assignor to Mary Ellen Enterprises Inc., St. Louis Park, Minn.

Filed Mar. 30, 1984, Ser. No. 595,562
Int. Cl.³ A45C *11/32*
U.S. Cl. 206—457 6 Claims



1. An article hiding container for keys and similar items comprising a unitary and integral solid body formed from a single piece of plastic resin having a contoured upper surface and a lower support surface,

said upper surface having an irregular shape composed of portions having different contours and surface irregularities therein to resemble a stone,

said upper surface defining continuous and uninterrupted top and side walls and said walls being free from openings which, if present, could expose the interior of the article to view or otherwise indicate that the article was not a real stone,

said container body having an article holding pocket therein communicating only with the lower support surface,

said container body including side wall portions surrounding the pocket on all sides thereof to space the pocket away from the side wall of the stone whereby an open end of the pocket is located in the lower support surface with portions of the support surface wall surrounding the open end on all sides and spacing the open end of the pocket inwardly from the peripheral edge of the lower support surface on all sides,

the pocket being of a larger size than keys that are to be held therein such that one or more keys will fit loosely within the pocket and being thereby enclosed but otherwise unconnected to the container body for quick removal from the container body by being free to fall out through said open end whereby any one of several of said keys can be removed without being disconnected mechanically from the container body and the others allowed to remain in place,

said open end having a pair of horizontally disposed retaining slots adjacent the open end of the pocket in parallel relationship and facing one another,

said slots running along opposite sides of the open end and being spaced inwardly from the support surface,

a door having a pair of parallel side edges adapted to fit in the slot and to slide in and out to either cover or expose articles held in the pocket,

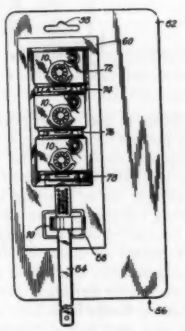
the lower support surface being formed as an extended support means of substantial width and breadth and being sufficiently flat to allow the container to be stable when resting on the ground and the slots being spaced inwardly from the support surface to hold the cover in place over the pocket while the portions of the support surface surrounding the pocket on all sides hide the edges of the cover from view when the container rests on the ground in an upright position.

4,531,636

CLAMPING DEVICE AND DISPLAY SYSTEM

Frank Salacuse, New York, N.Y., assignor to Super Glue Corporation, Ridgewood, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,968
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—461 4 Claims



1. A display system in combination with a number of snap-action clamping devices, Comprising:

A number of snap-action clamping devices;

A rectangular shaped card having an aperture for mounting said card on a display rack;

A molded cover having a plurality of compartments, each compartment housing one of said snap-action clamping devices;

A flat raised portion having means defining an opening enabling one of said snap-action clamping devices to protrude from said portion holding an object whereby a prospective purchaser is enabled to operate said snap-action clamping device thereby familiarizing himself with said snap-action clamping device before purchase.

4,531,637

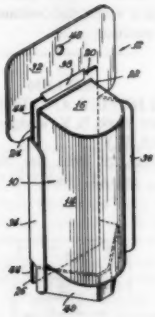
PACKAGE SHAPED TO HANG OR STAND ON END

James A. Cusmano, Gladstone, N.J., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Feb. 24, 1984, Ser. No. 583,248
Int. Cl.³ B65D *73/00, 75/00*
U.S. Cl. 206—461 14 Claims

1. A vertically elongated package suitable for handing or standing on end, comprising

a. a blister portion including a receptacle having a closed bottom, front and sides, and a substantially flat, open back,
b. a top flange extending upwardly from said receptacle at said back,
c. a bottom flange extending downwardly from the bottom of said receptacle at said back, said bottom flange comprising a rear support for use in standing said package on end,
d. a retention element disposed in the bottom of said receptacle and spaced forwardly from said bottom flange,
e. a carrier portion joined to said blister portion and including a flat rear panel abutting said open back, said carrier portion being disposed vertically and having a bottom and a top, and
f. means for removably mounting said blister portion upon said carrier portion, comprising
i. flap means formed in said rear panel for securing thereunder said top flange to said rear panel, and



ii. receiving means in said carrier portion at the bottom of said carrier portion for engaging and holding said retention element and thus said blister portion against said rear panel, said receiving means further comprising a front support for use in standing said package on end and extending outwardly from said bottom flange beneath the bottom of said receptacle when said blister portion is mounted upon said carrier portion,
iii. said flap means being situated in said rear panel such that when said blister portion is mounted on said carrier portion, said top flange is secured to said panel by said flap means and said bottom flange is situated at the bottom of said carrier portion,
g. said receiving means and said bottom flange of said blister portion in combination comprising a rest for supporting said package on end on a horizontal surface.

4,531,638

MOUNTING MEANS FOR REMEMBRANCE ITEMS

Vivian M. Jacobozzi, 2836 N. 76th Pl., Scottsdale, Ariz. 85251, and Steven D. Beltrand, Scottsdale, Ariz., assignors to Vivian M. Jacobozzi, Scottsdale, Ariz.

Filed Nov. 18, 1983, Ser. No. 553,362
Int. Cl.³ B65D *77/00*
U.S. Cl. 206—486 **17 Claims**

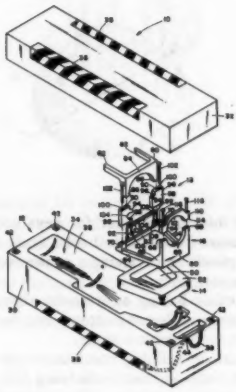
2. A combination of mounting means and mountable remembrance items to designate a special occasion, comprising, in combination, a mounting support having means coupled to said mounting support for holding a plurality of said mountable remembrance items, and at least one of said mountable remembrance items removably mounted to said mounting support;
said mounting support including a board whose outside configuration can be varied to meet the needs of each special occasion; and
said means coupled to said mounting support including a plurality of vertical slots passing through said board and a plurality of circular apertures passing through said board, each of said circular apertures being located on top of a corresponding one of said vertical slots so that each of said mountable remembrance items can be removably mounted on said board by inserting each of said mountable remembrance items through one of said circular apertures and sliding each of said mountable remembrance items down said corresponding one of said vertical slots.

4,531,639

MANUFACTURING SUPPORT AND SHIPPING PACKAGE

David Zopf, 2602 Rockdale, Lansing, Mich. 48917

Filed Sep. 15, 1983, Ser. No. 532,318
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—523 **6 Claims**



1. A package for handling sensitive objects comprising:
an elastomeric pad;
a rigid support structure having a base resting on said elastomeric pad;
gripping means for engaging said sensitive object, said gripping means being disposed on said support structure;
a coating of release agent disposed on the surface of said rigid support structure;
a molded at least semi-rigid foam block forming a container for receiving said sensitive object, said elastomeric pad and said rigid support structure being embedded and at least partially molded into said foam container, said gripping means being disposed outside of said block to facilitate engagement of said sensitive object; and
said base having a substantially horizontal surface fully supported by said elastomeric pad, said rigid support structure being vertically oriented over said elastomeric pad, and said rigid support structure having sides which

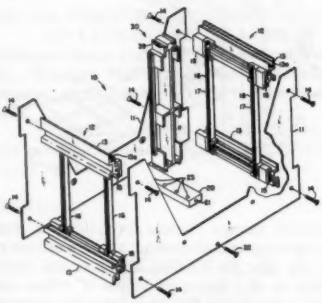
extend between said base and said gripping means in a range from substantially vertical to inwardly sloping to provide for the vertical displacement of said rigid support structure, relative to said container, upon compression of said elastomeric pad; whereby the weight of said sensitive object is supported and cushioned from shock by the compression of said elastomeric pad and the reciprocating vertical displacement of said rigid support structure relative to said container.

4,531,640

FRAME FOR SUPPORTING CIRCUIT BOARDS

Satish C. Shah, San Diego, Calif., assignor to Electronic Solutions, San Diego, Calif.

Filed Sep. 12, 1983, Ser. No. 531,431
Int. Cl.³ A47G *19/08*
U.S. Cl. 211—41 **4 Claims**



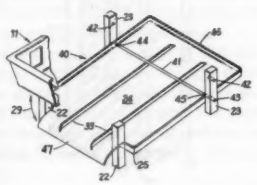
4. Apparatus for supporting a circuit board of reduced longitudinal dimension within the confines of a frame of greater longitudinal dimension, comprising a circuit board support member including a body element, a stand-off element extending outwardly from a side of said body element, and a guide element mounted on said stand-off element in spaced apart relationship with said body element, said guide element being adapted to receive a marginal edge portion of said circuit board, said apparatus not limiting the longitudinal dimension of other circuit boards supportable within said frame adjacent either side of said circuit board, said apparatus further comprising fastening means on said guide element for removably securing said guide element to said stand-off element.

4,531,641

DISH RACK AND DRAINBOARD

Gene Archambault, 25 Green Acre Dr., Waterbury, Conn. 06705

Filed Jun. 20, 1983, Ser. No. 506,056
Int. Cl.³ A47G *19/08*
U.S. Cl. 211—41 **13 Claims**



4. A dish drainer comprising:

dish rack means for receiving dishes and having a water drainage slot;

a plurality of spaced apart support leg means affixed to said dish rack means;

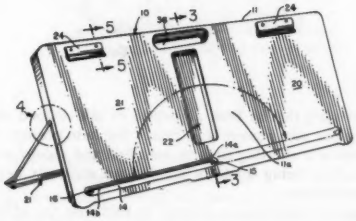
drain board means having a drainage surface portion positionable beneath the water drainage slot, and having mounting means to enable disposing of said drainage surface portion at a plurality of drainage inclines with said drain board means being pivotally mounted to enable shakable motion of the drain board means.

4,531,642

PORTABLE DESK

John J. Racich, Joliet, Ill., assignor to G Q Games, Inc., Joliet, Ill.

Filed Jan. 3, 1984, Ser. No. 567,667
Int. Cl.³ A47B *65/00*
U.S. Cl. 211—42 **7 Claims**



1. A portable desk comprising, in combination, a rectangular, planar desk board having upper and lower portions and providing two longitudinally spaced, flat-top working areas, said flat-top working areas occupying a major portion of the surface area of the desk board, means comprising a receptacle for writing instruments and the like located on the desk board adjacent to the working areas, an elongated bookrest arranged in the lower portion of the desk board to underlie one of the working areas, clamping means provided along the upper portion of the desk board to overlie one of the spaced working areas for clamping a book, paper or the like in place over said working area, and hand grip carrying means for the portable desk located in the central upper portion of the desk board; and a stand for said desk board operable between open and closed positions and comprising arm means swingably secured to the longitudinal ends of the desk board, and means provided along the lower portion of the board for cooperating with the arm means to lock said arm means against the board when the stand is in closed position as well as to afford a hand grip carrier for the portable desk.

4,531,643

PORTABLE SPORTING IMPLEMENT HOLDER

Russell Bradley, Ashland, Ky., assignor to Sporting Aid, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 350,990, Feb. 22, 1982,. This application Sep. 2, 1982, Ser. No. 413,992
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—64 **5 Claims**

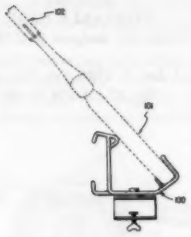
1. A portable sporting implement releasable holder, comprising:

(1) a base adapted to be secured to a rigid support therefore;

(2) a first implement support member attached to said base and projecting a predetermined distance upwardly from said base, said first support member having an enlarged uppermost portion, which enlarged portion is of sufficient size as to receive the stock of a sporting firearm near the butt thereof, and said enlarged portion also having a downwardly disposed recess capable of receiving a portion of a handle of a sporting fishing rod;

(3) a second implement support member attached to said

base and projecting a predetermined distance upwardly from said base, and wherein the said predetermined distance of said first support member is greater than said predetermined distance of said second support member, whereby said implement is disposed in said holder such that a support angle of the implement is established which is sufficient to wedge said implement between said first and second support members and said second support member having an upwardly curved or angled configura-



tion such that at least a portion of said second support member can receive and retain the butt portion of the stock of a sporting firearm; said first and second support members being made of a rigid but manually bendable material and

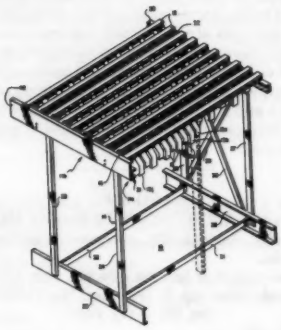
(4) an adjustable means secured to said base for adjustably clamping said base to said rigid support therefore such that the holder may be placed in an essentially vertical position even though the said rigid support may be in a horizontal, vertical or inclined position.

4,531,644

STORAGE AND DELIVERY MAGAZINE FOR SKIS

David K. Margulies, 4650 S. 1884 East, Salt Lake City, Utah 84117

Filed Mar. 7, 1980, Ser. No. 127,945
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—70.5 **9 Claims**



1. A storage and delivery magazine for skis which comprises:

a plurality of tracks;

a plurality of gondola holders, each including a pair of arms hingedly mounted to hold a pair of skis between said arms by their tips suspended approximately vertically therefrom and biased toward a vertical orientation to swing out of the way to enable a pair of skis to be removed from the next gondola holder without obstruction, each gondola holder being suspended from a said track for movement along said track, including roller means at one end in operable engagement with a track, the other end of each gondola being structured to hold skis; and

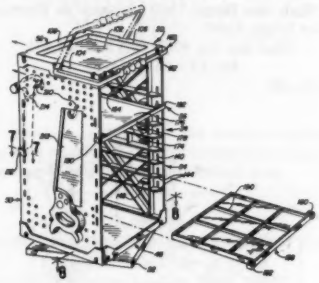
means for holding said tracks sufficiently above a base that the suspended skis are held out of contact above the base.

4,531,645

PORTABLE STORAGE CONSOLE

Thomas A. Tisbo, Barrington, and George L. Garcia, Chicago, both of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Jul. 7, 1983, Ser. No. 511,488
Int. Cl.³ A47F *5/02*
U.S. Cl. 211—131 **27 Claims**



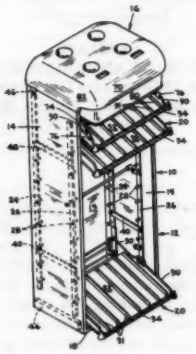
1. A portable storage console for holding a plurality of articles, comprising, in combination; a base, a cabinet rotatably secured to the base for rotating about an axis substantially perpendicular to the base, a plurality of rollers positioned between the cabinet and the base rotatably supporting the cabinet on the base, and a plurality of trays removably mounted in the cabinet, each of said trays extending substantially the entire interior width and depth of the cabinet, each of said trays being releasably locked to the cabinet in an attitude substantially perpendicular to the axis of rotation of the cabinet.

4,531,646

PRODUCT DISPLAY RACK

Fred Howard, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.

Filed Oct. 5, 1984, Ser. No. 658,311
Int. Cl.³ A47F *3/06*
U.S. Cl. 211—150 **9 Claims**



1. A gravity-fed product display rack comprising a frame, support means cooperating with said frame, a plurality of superposed tray assemblies carried by said support means and

movable between a downwardly inclined product package display and dispensing position and an upwardly inclined product package loading position, a header assembly mounted upon said frame for displacement relative thereto, and elevator means secured to one of said plurality of superposed tray assemblies for controlling the displacement of said header assembly relative to said frame as said tray assemblies are displaced between upwardly and downwardly inclined positions.

4,531,647

DEVICE FOR STOPPING THE SWINGING MOVEMENT OF A LOAD HUNG BY A CRANE

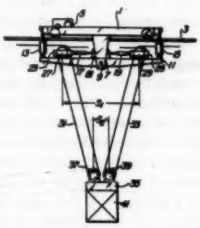
Masao Higuchi; Shuzo Uno, both of Kudamatsu; Yasuhisa Ishii, Hikari; Kazuhiro Makino, and Kenichi Okasaka, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,804

Claims priority, application Japan, Jan. 14, 1976, 51-2796; May 12, 1976, 51-53672

Int. Cl.³ B66C *17/00*

U.S. Cl. 212—147 **26 Claims**



1. A device for stopping a swinging movement of a load hung by a crane having an overhead girder, the device comprising:

a trolley adapted to be mounted on the overhead girder of the crane and capable of traveling on and along the overhead girder;

a beam pivotally supported substantially at a longitudinal center thereof to said trolley so as to enable said beam to pivot about a pivot axis substantially in a vertical plane;

at least one pair of carriage means supported on said beam and disposed at opposite sides of and spaced from the pivot axis;

adjusting means for moving the carriage means toward and away from each other to adjust a distance between said at least one pair of carriage means;

sheave means mounted on each of said carriage means;

a first rope means trained over and depending from said sheave means on one of said carriage means;

a second rope means trained over and depending from said sheave means on the other of said carriage means;

a suspension member connected to lower ends of said rope means;

damping means mounted between the trolley and the beam for damping the pivoting movement of the beam in the vertical plane; and

means for controlling an amount of damping to be effected in dependence upon at least a weight of the load.

4,531,648

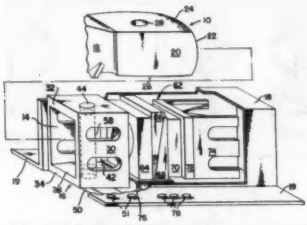
RAILWAY CAR DRAFT GEAR WITH SLACK ADJUSTMENT AND CUSHIONING

H. Neil Paton, 1218 Third Ave., Suite 1022, Seattle, Wash. 98101

Filed Sep. 30, 1982, Ser. No. 430,494

Int. Cl.³ B61G *7/10*

U.S. Cl. 213—50 **4 Claims**



1. A draft gear, comprising:

(a) a female connector having a cavity;

(b) backstop means operatively associated with said cavity;

(c) a male connector having an end insertable into said cavity, said end including a bore;

(d) draft pin means connectable to said female connector and extendable through said bore for securing said male connector in said cavity with the end of said male connector spaced from said backstop means, said draft pin means being sufficiently smaller than said bore that the end of said male connector is movable with respect to said draft pin means between a first position in which said bore contacts one face of said draft pin means during application of draft loads and a second position in which said bore contacts another face of said draft pin means opposite said one face during application of buff loads; and

(e) combination slack adjustment and cushioning means acting between said backstop means and the end of said male connector for normally maintaining said male connector in said first position, but allowing it to shift against a resilient resistance toward said second position in response to a buff load and a pitching force, said slack adjustment and cushioning means comprising;

(i) a follower adapted to engage the end of said male connector,

(ii) a buff taper plate,

(iii) wedge means acting between said follower and said buff taper plate for controlling the spacing between them in order to take up slack, and

(iv) resilient cushioning means acting between said buff taper plate and said backstop means providing a resilient force transmitted via said buff taper plate, said wedge means and said follower to the end of said male connector urging it toward said first position and resisting movement of it toward said second position,

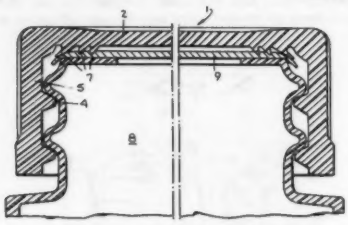
(v) said cushioning means comprising a single elastomeric pad compressively held between said buff taper plate and said backstop means in an alignment generally perpendicular to the directions in which buff and draft loads are applied, said pad occupying essentially the entire space between said wedge means and being of a thickness sufficient to withstand further compression in resistance to movement of the end of said male connector toward said second position while maintaining said buff taper plate spaced from said backstop means.

4,531,649

MOLDED PLASTIC CAP WITH SEALING LINER

Robert W. Shull, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 23, 1984, Ser. No. 602,686
Int. Cl.³ B65D *53/04*
U.S. Cl. 215—232 **15 Claims**



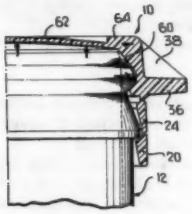
1. An improved closure cap for forming a seal on a container sealing surface including an irregular sealing surface of a container comprising the combination of a molded closure shell having a cover and a depending skirt with container engaging thread means on the interior of said skirt, and a downwardly projecting sealing fin means molded integrally with the shell on the underside of the shell cover, and a sealing liner positioned within said shell for engaging the container sealing surface with its lower surface and the sealing fin means with its upper surface, said sealing fin means comprising a plurality of circular fins with a radially outermost fin being larger than the remaining fin or fins and being flared outwardly and positioned to force the outer edge of said sealing liner around the corner of the container finish, and said sealing liner comprising a plurality of layers including a soft plastic layer for engaging said sealing fin means and an adhesive bottom layer for adhering the liner to the container finish.

4,531,650

PLASTIC CAP WITH PRESSURE SEAL

Kenneth F. M. Friendship, Simsbury, Conn., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 910,520, May 30, 1978, abandoned. This application Sep. 26, 1980, Ser. No. 191,197
Int. Cl.³ B65D *41/48*
U.S. Cl. 215—256 **13 Claims**



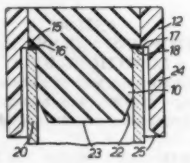
1. A pressurized container and closure therefor combination, said container including a neck terminating in a lip defining a mouth, said neck having an external finish, said container and said closure each being formed of a resiliently deformable plastics material, said closure cap including an end panel and a depending skirt, said skirt having an inner surface including an upper portion and a lower portion, said skirt surface lower inner portion having thereon closure means in interlocking engagement with said neck finish for retaining said closure on said neck, and said skirt inner surface upper portion defining an inwardly and upwardly sloping wedge surface means for engaging said container lip and forming a resilient seal therewith, said end panel being of a reduced thickness radially inwardly of said wedge surface means and is axially outwardly bowed under pressure from within said container with said wedge surface means being drawn radially inwardly.

4,531,651

BLOOD SAMPLING CONTAINERS

Thomas K. Donnelly, The Bank House, Customs Quay, Wexford, Ireland

Filed Sep. 8, 1983, Ser. No. 530,303
Claims priority, application United Kingdom, Sep. 8, 1982, 8225544
Int. Cl.³ B65D *41/28*
U.S. Cl. 215—354 **13 Claims**



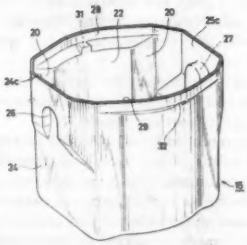
1. A closure for a container comprising a core of elastomeric material constructed of a shape and arranged for being received at least partially within the container, and an annular outer section of substantially non-elastomeric material disposed radially with respect to the core section over a part of its length to provide an annular recess for receipt of the container neck, said annular recess being defined by an inner wall comprised of said core section, an outer wall comprised of said annular section and a base comprised of a connection between said core section and said annular section, and said connection between said core section and said annular section being comprised of an extension of said annular section into a groove located in said core section, such that said extension of said annular section contacts the top surface of the mouth of the container when the closure is in use in sealing a container.

4,531,652

BUCKET FOR USE IN CENTRIFUGAL SEPARATORS

Minoru Hara, Sakado, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,168
Int. Cl.³ B04B *9/12*
U.S. Cl. 220—83 **7 Claims**



1. A bucket for suspension from a swing-type rotor in a centrifugal separator, comprising:

(a) first, second, third and fourth integrally joined, successive side walls jointly providing a hollow rectangular-parallelepiped-shaped body, and a bottom plate integrally

joined to the lower edges of said first through fourth side walls;

(b) said first and third side walls having substantially flat end portions which are disposed in diametrically opposite relation to each other and having circumferentially central portions which are displaced radially outwardly from said substantially flat end portions to form a pair of arcuate wall portions on said first and third side walls respectively which arcuate wall portions are parts of a cylindrical surface extending substantially around a central axis of the bucket;

(c) said second and fourth side walls being substantially flat and being disposed in diametrically opposite relation to each other, the upper portions of said second and fourth side walls being displaced radially outwardly in an inverted U-shape to form first and second bearings having recesses in the outer surfaces of said second and fourth side walls shaped to allow the bucket to be swingably suspended on the rotor; and

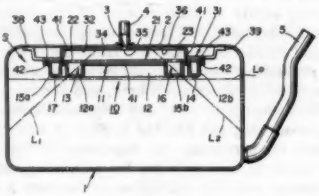
(d) said second and fourth side walls being spaced from each other by a distance that is at least equal to the diameter of said cylindrical surface.

4,531,653

VENTILATION DEVICE FOR FUEL TANKS

Yoshiyasu Sakata, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,804
Claims priority, application Japan, Sep. 12, 1983, 58-167949
Int. Cl.³ B65D *25/00, 90/34;* F16K *24/04*
U.S. Cl. 220—85 S **9 Claims**



1. A ventilation device on a top wall of a fuel tank mounted on a motor vehicle, comprising:

(a) an upper panel fixedly mounted on an inner surface of said top wall of said fuel tank and extending substantially horizontally, said upper panel having an opening vented to atmosphere;

(b) a middle panel fixedly mounted on a lower surface of said upper panel;

(c) a lower panel fixedly mounted on a lower surface of said middle panel and having first and second openings communicating with an interior of said fuel tank;

(d) said lower and middle panels jointly defining first and second passages;

(e) said upper and middle panels jointly defining a chamber;

(f) said first and second openings communicating with said first and second passages, respectively;

(g) said middle panel having first and second through holes providing communication between said first and second passages and said chamber; and

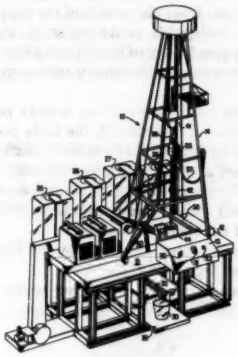
(h) said opening in said upper panel communicating with said chamber.

4,531,654

DRINK DISPENSING DEVICE

Gerard E. Guyon, P.O. Box 4488, South Edmonton, Alberta, Canada

Filed Jun. 9, 1983, Ser. No. 502,756
Claims priority, application Canada, Jun. 23, 1982, 405839
Int. Cl.³ B67D *1/00*
U.S. Cl. 222—78 **9 Claims**



1. A drink dispensing device which simulates the appearance and operation of a drill rig comprising a base structure on which is mounted a model of a drill rig, control circuitry, and a plurality of drink dispensers, said drill rig including a rig frame, a block, and a kelly bar suspended from said block via a swivel mechanism, said device including means to raise and lower said block together with said kelly bar and means to rotate said kelly bar, each drink dispenser comprising a solenoid which, when actuated, releases a predetermined amount of liquid into a collection means leading to a receptacle, said control circuitry including a switch means for selecting a drink dispenser solenoid and means for energizing (i) a selected solenoid, (ii) said means to raise and lower said block to thereby move said kelly bar from a predetermined first position, and (iii) said means to rotate said kelly bar, said device having means, responsive to moving of the kelly bar to a predetermined second position, to deenergize said means to rotate said kelly bar and to energize said means to raise and lower said block so as to move said block towards said first position, said device having means, responsive to moving of said kelly bar back to said first position, to deenergize said means to raise and lower said block.

4,531,655

CONTAINER FOR FLUIDS

Joe A. Putnam, 14007 Two Notch Ct., Midlothian, Va. 23113

Filed Jun. 15, 1983, Ser. No. 504,613
Int. Cl.³ B65D *47/22*
U.S. Cl. 222—105 **27 Claims**

1. A liquid storage and dispensing container comprising:

a substantially rigid support container having a pouring and receiving mouth and a pressure equalizing apperture for establishing fluid communication between an interior position of the support container and the ambient environment of the support container;

a substantially liquid and gas impervious collapsible container disposed within and supported by the support container, the collapsible container having an upper portion defining a opening therein, the upper portion of the collapsible container connected to the support container such that the opening in the collapsible container is in fluid communication with the pouring and receiving mouth of the support container;

primary sealing means supported by the support container and selectively movable between a first position and a second position, in the first position the primary sealing means disengaging the portion of the collapsible container so as to permit flow of liquids and gases into and from the collapsible container via the pouring and receiving mouth of the support container, in the second position the primary sealing means engaging a portion of the collapsible container a selected predetermined distance from the mouth of the support container and sealing the collapsible container so as to substantially prevent the escape and entry of liquids and gases from and into the collapsible container, said primary sealing means comprising:

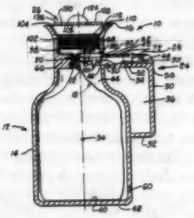
a ram having a first end portion, a body portion and an opposed second end portion, the body portion slidably supported by the support container such that the first end portion of the ram is disposed within the interior portion of the body portion of the support container and the opposed second end is disposed external the body portion of the support container;

a male seating member supported by the first end portion of the ram; and

a female seating member supported within the interior portion of the body portion of the support container and aligned with the male seating member such that upon moving the ram in the direction of the female seating member, the male seating member engages a portion of the collapsible liner disposed between the male seating member and the female seating member, and seals the collapsible container when the male seating member is in a seating relationship with the female seating member;

secondary sealing means for selectively opening and closing the pouring and receiving mouth of the support container, the secondary sealing means supported by a portion of the support container defining the pouring and receiving mouth thereof; and

a handle assembly having an elongated upper segment supported by the support container, the elongated upper segment of the handle assembly being substantially normally disposed to a central elongated axis of the body portion of the support container, the upper segment of the handle assembly having an elongated slot formed therein, the elongated slot communicating with the interior portion of the body portion of the support container and adapted to slidably receive the body portion of the ram such that the opposed second end portion of the ram extends outwardly from the elongated slot.



4,531,656

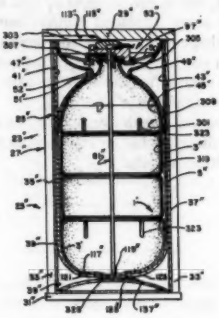
SYSTEM, APPARATUS AND METHOD OF DISPENSING A LIQUID FROM DISPOSABLE CONTAINER AND A CONTAINER THEREFOR

Harold L. Nitchman, 1230 Parody, St. Charles, Mo. 63301, and William B. Cunningham, Jr., 916 Woodshire, St. Louis, Mo. 63141

Continuation-in-part of Ser. No. 439,115, Nov. 4, 1982, which is a continuation-in-part of Ser. No. 363,511, Apr. 2, 1982, Pat. No. 4,491,247, which is a continuation-in-part of Ser. No. 285,611, Jul. 21, 1981, Pat. No. 4,440,319. This application Apr. 22, 1983, Ser. No. 487,561

Int. Cl.³ B67D 5/60; F25J 5/60

U.S. Cl. 222—131 **10 Claims**



1. Apparatus for dispensing liquid from a disposable container, said disposable container having a mouth, said apparatus comprising means for withstanding pressurization forces exerted on said container upon internal pressurization thereof, said pressure withstanding means comprising a shroud having a first portion for receiving at least in part a portion of said disposable container and having another portion receiving another portion of said disposable container with said shroud portions being axially movable relative to one another, said pressure withstanding means further comprising a frame for receiving said shroud with said disposable container therein, said frame preventing outward axial movement of said shroud portions beyond a predetermined limit, said shroud including means sealably engagable with said disposable container for admitting pressurizing gas into the interior of said dispoable container and for permitting the dispensing of liquid therefrom, said container having means for permitting elongation and compression within a limited range between a shortest permissible length and a maximum permissible length, said shroud further oomprising means for accommodating a range of lengths of said disposable container, this last said means comprising said shroud portions being telescopic and permitting a disposable container of a shortest permissible length to be readily sealed relative to said means sealably engagable with said container and permitting a container of a maximum permissible length to be compressed in axial direction as said shroud with said container received therein is inserted in said frame so that upon internal pressurization of said container, a positive seal is made between said means sealably engagable with said container and said container.

4,531,657

TAPPING STOPPER

Tadao Saito, Tokyo, and Riichi Ogawa, Matsudo, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Japan

Filed Apr. 20, 1982, Ser. No. 370,292

Int. Cl.³ B65D 23/06

U.S. Cl. 222—108 **3 Claims**

1. A tapping stopper for use on the mouth of a bottle containing a liquid to be poured, said tapping stopper comprising:

a pouring cylinder comprising:

a first cylindrical surface, a first annular lip extending perpendicularly to an axis of said first cylindrical surface, and a first transitional surface;

said first transitional surface having a first curved surface joining an end of said first cylindrical surface and an inner diameter of said first annular lip;

an auxiliary cylinder coaxially surrounding said pouring cylinder and said auxiliary cylinder comprising:

a second cylindrical surface, a second annular lip extending perpendicularly to an axis of said second cylindrical surface, and a second transitional surface;

said second transitional surface having a second curved surface joining an end of said second cylindrical surface and an inner diameter of said second annular lip; and

a bottom plate coupled between said pouring cylinder and said auxiliary cylinder to define a circular groove surrounding said pouring cylinder between said pouring cylinder and said auxiliary cylinder,

said lip of said auxiliary cylinder being spaced from and below said lip of said pouring cylinder by a distance such that when pouring liquid through said pouring cylinder, some of the liquid enters the circular groove and is then poured from the auxiliary cylinder, and the flow of liquid from the lip of said pouring cylinder pulls up the flow of liquid from said auxiliary cylinder due to surface tension of the liquid to form a combined liquid flow.

4,531,658

MEASURED CHARGE DISPENSER, PARTICULARLY FOR POWDERED MATERIAL

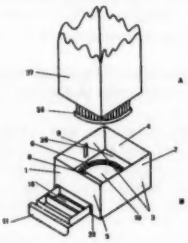
Fernand Galopin, 11, boulevard Albert ler, Monaco, Monaco

Filed Nov. 27, 1981, Ser. No. 325,363

Claims priority, application Monaco, Dec. 5, 1980, 1486

Int. Cl.³ G01F *11/18*

U.S. Cl. 222—181 **11 Claims**



1. A measured charge dispenser for particulate material, comprising a base adapted to support a receptacle that contains the material, and a drawer slidable horizontally beneath the receptacle between an open and a closed position, the base having an opening through which the receptacle communicates with the drawer, the drawer having at least one upwardly and downwardly opening chamber therein to receive material through said opening in the closed position of the drawer, said chamber being disposed outside the base when the drawer is in the open position to discharge material from the drawer by gravity, the base having a bottom wall that is disposed beneath and closes the compartment when the drawer is in the closed position, the base having a horizontal wall disposed above said bottom wall, the drawer sliding between said walls, said opening being formed in said horizontal wall, an upstanding cylindrical flange on said horizontal wall surrounding said opening, said base having side walls upstanding from said horizontal wall and spaced outwardly from said cylindrical flange, the receptacle having a neck surrounding said cylindrical flange and a resilient finger carried by a said side wall of the base and overlying the cylindrical flange and pressing said neck of said receptacle against the cylindrical flange.

4,531,659

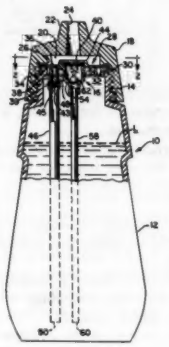
FOAM DISPENSING DEVICE AIR RETURN SYSTEM

Hershel E. Wright, P.O. Box 51, Decatur, Ill. 62525

Continuation of Ser. No. 352,936, Feb. 26, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 604,125

Int. Cl.³ F04C *1/14*

U.S. Cl. 222—190 **9 Claims**



1. A foam dispenser device, comprising:

(a) a container for holding foamable liquid having a discharge port and a bottom, and

(b) a foam producing unit mounted to the container and separating the area adjacent the discharge port and the interior of the container, said foam producing unit including:

(1.) a closure means for the container having air inlet means and foam outlet means,

(2.) air return means communicating with the air inlet means and including an elongate, inwardly extending conduit having an opening communicating with the interior of the container,

(3.) valve means closing the air return means when pressure is applied to the container and opening the air return when the pressure applied to the container is relieved,

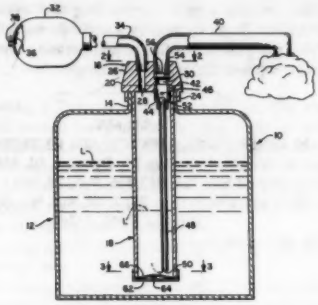
(4.) foam producing means communicating with the foam outlet means and including an elongate inwardly extending conduit having an opening communicating with the interior of the container said foam producing means further including at least one additional opening communicating with the interior of the container, and

(5.) the air return conduit and the foam producing means conduit being of a length so that when the container is inverted the openings of each conduit communicating with the interior of the container are disposed in the air space adjacent to the container bottom whereby foam may be dispensed when the container is in the inverted position.

4,531,660
FOAM DISPENSING DEVICE

George W. Ford, Jr., Salt Lake City, Utah, assignor to Hershel Earl Wright, Decatur, Ill.

Continuation of Ser. No. 330,254, Dec. 14, 1981, abandoned.
This application May 29, 1984, Ser. No. 614,704
Int. Cl.³ B65D 37/00
U.S. Cl. 222—209 4 Claims



1. A foam dispenser device, comprising:

(a) an outer container for holding foamable liquid having a discharge port, and

(b) a foam producing unit mounted to the container and separating the area adjacent the discharge port and the interior of the container, said form producing unit including:

1. an inner container disposed within the outer container, and having an opening communicating with said outer container,
2. a closure for the inner container having pressurized air inlet means communicating with the inner container and foam outlet means,
3. foam producing means communicating with the foam outlet means, said foam-producing means including air-receiving means communicating with the air inlet means to receive pressurized air and liquid-receiving means including an inwardly extending conduit having an opening communicating with the interior of the inner container to receive liquid,
4. valve means for the inner container opening said valve means selectively closing said opening when air pressure within the inner container is increased, to supply foamable liquid from the inner container to the conduit of the foam producing means, said valve means selectively opening said opening when air pressure within the inner container is decreased to permit flow of foamable liquid from the outer container to the inner container, and

(c) a pump means supplying pressurized air to the air inlet means, said pump means including an opening communicating with ambience and valve means selectively closing said opening when air pressure within the pump means is increased and selectively opening said opening when air pressure within the opening is decreased to admit air into said pump means.

4,531,661
SKI AND POLE HOLDER

James L. Santy, Box 783, Park City, Utah 84060

Filed Mar. 16, 1984, Ser. No. 590,564
Int. Cl.³ B65D 63/00
U.S. Cl. 224—191 1 Claim

1. A ski and ski pole holder comprising

a pair of straps, each having a back surface and a front surface and with said straps being connected in back to back relationship adjacent one of their ends and each of said ends being passed through and around a ring and sewn to the strap at the back-to-back connections of said straps;

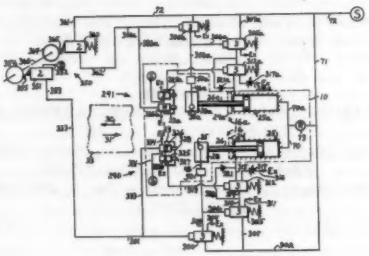
a napped face on each of the front surfaces of said straps extending from the back-to-back connections for a length of the strap; and

a hooked surface on each of the straps, said hooked surfaces extending from the napped surfaces to the other ends of the straps, whereby upon insertion of said other ends through the rings and turning of said other ends back upon themselves the hooked surfaces will interlock with the napped surfaces.

4,531,662
CONTROLS FOR DUPLEX FEEDERS

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed May 19, 1983, Ser. No. 496,055
Int. Cl.³ B65H 17/36
U.S. Cl. 226—159 6 Claims



1. In a feeder for intermittently advancing stock into the work station of a punch press or the like: comprising

a frame;

feed slide means carried by said frame for reciprocating movement in feed and index directions;

stock gripping means carried by said feed slide means ;

a main fluid motor means for actuating said feed slide means;

second fluid motor means for actuating said stock gripping means;

control means for said fluid motor means for causing said feed slide means to move through alternate index and stock feed strokes;

said control means including a first valve means, said first valve means being adapted to normally control the exhaust of pressure fluid through said first valve means from one end of said main fluid motor means during stock feed strokes of said feed slide means;

buffer means for cushioning the terminal portions of the stock fees strokes of said feed slide means, said buffer means including

secondary valve means having fluid flow restriction means, said secondary valve means when operated

serving to discontinue the normal exhaust fluid flow rate through said first valve means by directing exhaust flow through said restriction means whereby the resultant increased impedance to said exhaust flow from said one end of said main fluid motor means affords a cushioning action of the movement of said feed slide means; and

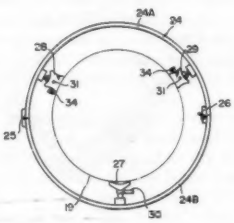
sensing means adapted to be actuated in response to the terminal portion of a stock feed stroke of said feed slide means for operating said secondary valve means thereby affording a cushioning action for the said terminal portion of said feed stroke of the feed slide means.

4,531,663

GUIDE APPARATUS

Shigeru Kajiyama; Kazuo Takaku; Akisuke Naruse, and Akira Akasu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Dec. 2, 1982, Ser. No. 446,212
Claims priority, application Japan, Dec. 4, 1981, 56-194552
Int. Cl.³ B23K *5/08*
U.S. Cl. 228—29 **7 Claims**



1. A guide apparatus comprising:

an annular rail means adapted to be attached concentrically to an outer periphery of a cylindrical member to be processed by a processing means;

attaching means provided on an inner peripheral surface of said annular rail means for attaching said annular rail means onto the outer periphery of said cylindrical member;

driving means for running said processing means along above the outer periphery of said cylindrical member;

wherein said attaching means includes at least two first jaw means each having a jaw surface to be abutted on a part of the outer periphery of said cylindrical member and at least one second radially movable jaw means for stationarily clamping said annular rail means onto said cylindrical member, said first jaw means are disposed on said annular rail means so as to concentrate a center of said annular rail means on that of said cylindrical member, and wherein a radial distance between said abutting surface of said first jaw means and the inner peripheral surface of said annular rail means is discontinuously variable; and

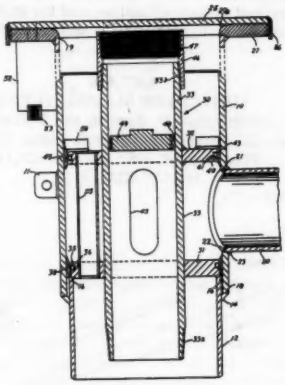
said first jaw means comprises polygonal jaw blocks at least two side walls of each block having curved surfaces the radii of curvature of which correspond to that of the cylindrical member to be processed, and wherein each said block is rotatable about a shaft fixed against said annular rail means and distances between said curved surfaces of each said block and the axis of each said shaft differ from one another.

4,531,664

METHOD OF MANUFACTURING A PITLESS ADAPTER

Henry A. Baski, 1586 S. Robb Way, Denver, Colo. 80226

Division of Ser. No. 317,452, Nov. 2, 1981, Pat. No. 4,416,328, which is a continuation-in-part of Ser. No. 99,831, Dec. 3, 1979, Pat. No. 4,298,065. This application Nov. 18, 1983, Ser. No. 553,198
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—125 **3 Claims**



1. The method of manufacture and assembly of an outer barrel unit of pitless adapter apparatus comprising the steps of:

cutting a length of standard relatively small diameter steel pipe to provide a predetermined length lower portion of the barrel unit adapted to be connected to a well casing;

cutting a length of standard relatively large diameter steel pipe to provide a predetermined length intermediate portion of the barrel unit;

cutting a discharge opening in the wall of the intermediate portion;

welding a connector member in the discharge opening;

fixedly mounting vertically axially spaced spool sealing ring members inside the intermediate portion on opposite sides of the discharge opening;

telescopically inserting the upper end of the lower portion into the lower end of the intermediate portion a predetermined distance to provide an overlapping joint therebetween;

welding the lower portion to the intermediate portion across the joint therebetween; and

machining the sealing ring members and the welded joint to provide concentric sealing surfaces on the sealing ring members and a beveled spool seating surface across the welded joint.

4,531,665

METHOD OF MANUFACTURING CLEVIS END CONNECTING ROD

Roland E. Cale, Jr., 732 Lakeview Ave., Cortland, Ohio 44410

Filed Mar. 18, 1983, Ser. No. 476,591
Int. Cl.³ B23P *15/00*
U.S. Cl. 228—170 **10 Claims**

1. A method of manufacturing a metal rod connecting member, such as a railroad car brake rod, having at least one bifur-

cated clevis end with aligned transverse bores to receive a connecting pin therethrough, comprising the steps of, forming a piece of straight metal bar stock to provide parallel bar free ends extending off in opposite directions from a central transverse offset connecting member, said parallel free bar ends lying in different planes, transversely severing said bar stock at the central portion of said offset, realigning the severed bar ends with each other to form a bifurcated jaw having laterally spaced parallel side portions merging to contact at their offset ends, buting an end of an elongated piece of metal stock against the severed end surfaces of said severed bar ends, and welding said end of said elongated stock to said severed end surfaces.

4,531,666

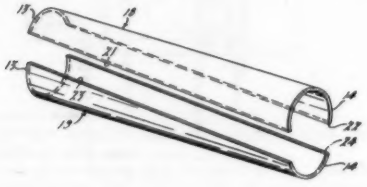
METHOD OF MAKING TUBES

Oliver C. Fuller; James R. Bennett, and J. Hall Skeen, all of Hinsdale, Ill., assignors to Oliver C. Fuller, Hinsdale, Ill.

Filed Aug. 24, 1983, Ser. No. 526,110

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—171 **5 Claims**



1. The method of forming tapered tubes from a cylindrical tube having a first end and a second end spaced along a longitudinal axis comprising the steps of severing the cylindrical tube on opposite sides and along a plane that is not parallel or perpendicular to the longitudinal axis to form two parts, the lengths of said parts at least the first end being unequal, reforming each of the parts in planes perpendicular to the longitudinal axis into the shape of circular sections at distances from said one end having a radius of a circle having a circumference equal to the length of the first part in the plane plus the length of the second part in a plane parallel to the plane and at the same distance from the second end, reversing one of the halves relative to the other half, and joining the thus reversed halves.

4,531,667

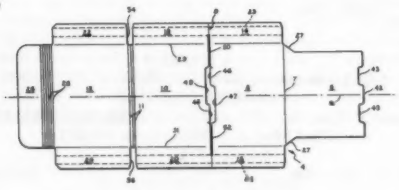
EXPANDABLE ENVELOPE FILE

Donn W. Meade, Chicopee, Mass., assignor to Dennison National Company, Holyoke, Mass.

Filed Aug. 8, 1983, Ser. No. 520,904

Int. Cl.³ B65D *27/08*

U.S. Cl. 229—1.5 R **1 Claim**



1. A unitary blank for forming an expandable, multi-pocket envelope, said blank formed by die-cutting and creasing a resiliently flexible sheet material to form said unitary blank having longitudinally spaced, laterally extending parallel crease lines defining a plurality of generally rectangular panels joined together in end-to-end relation by said crease lines and forming a generally rectangular blank of articulated panels, said blank including side edge flaps inwardly foldable along longitudinally extending hinge lines which are adapted to receive adhesive dispersed along one surface thereof, said blank including first and second outer end panels and first and second inner panels, the latter including adjacent edges spaced apart to define a laterally extending cutout and having at least one integral, laterally spaced index tab along each of said adjacent edges, the first outer end panel serving as a back cover for the envelope and the second outer end panel being adapted to be folded within said envelope to provide an inner partition therefor, the outer edge of said second outer end panel having an outer edge which includes at least one integal index tab which is laterally offset from each of the index tabs which extend from the adjacent edges of the inner panels, the panels of said envelope being dimensioned so that when the blank is folded sequentially from the second outer end panel until all said panels are superimposed one upon the other, all said tabs are disposed along the upper edge of the envelope in laterally offset relation.

4,531,668

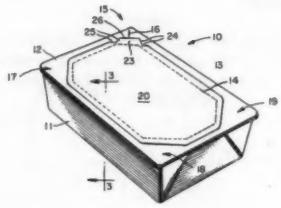
OVENABLE CARTON WITH REMOVABLE LID

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 6, 1984, Ser. No. 617,744

Int. Cl.³ B65D *5/54, 5/64*

U.S. Cl. 229—43 **3 Claims**



1. In combination, a cover member and a tray member both of substantially rectangular shape, said tray member having an outwardly extended integral top flange and said cover member having outer edges which are aligned with the outer edges of said tray flange, means for adhering the marginal edges of said cover member to the top flange area of the tray to close the tray, said cover member having at least four corners and comprising a generally planar blank of paperboard with upper and lower surfaces including a removable lid portion with an easy opening means, said removable lid portion being defined in said cover member by a pair of continuous, spaced apart, parallel cut lines of partial depth on the upper and lower surfaces of said cover member, said easy opening means comprising a first partial depth cut line in the upper surface of said cover member at one corner which extends from the apex of said corner to a diagonally oriented portion of said upper partial depth cut line between the adjacent sides of said corner, each end of the diagonally oriented portion of the upper cut line including abbreviated upper and lower partial depth cuts, portions of which are generally parallel to the diagonally oriented portion of the upper cut line and generally parallel to the upper partial depth cut lines along each adjacent side wall of the tray, said partial depth cut lines along all edges of the cover member being located inwardly from the innermost edge of the flange area of said tray throughout their entire lengths with the partial depth cut lines on the upper surface of said cover member being spaced from the innermost edge of the flange area by a distance equal to or greater than about one half the width of the flange area of said tray and the partial depth cut lines on the lower surface of said cover member being spaced from the innermost edge of the flange area by a distance equal to or

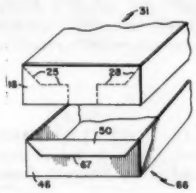
greater than the total width of said flange area to define a delamination area therebetween, wherein upon removal of the lid portion, a substantial portion of the cover member remains adhered to the flange area of the tray around its entire periphery so that the structural rigidity of the tray is not reduced to any substantial degree when the lid portion is removed.

4,531,669

INTERLOCK BETWEEN TELESCOPING COVER AND TRAY

Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,100
Int. Cl.³ B65D *5/54*
U.S. Cl. 229—45 R **1 Claim**



1. A self locking container formed from two telescoping components of generally rectangular shape comprising;

(a) a tray component including a bottom wall, opposed pairs of side walls and opposed pairs of end walls, said walls being upstanding from the bottom wall and connected together by gusset panels at each corner to form a leak-proof construction;

(b) at least one pair of lcoking flaps foldably attached to the upper edges of the opposed end walls, said locking flaps having a length substantially equal to the length of the attached end walls and a height that is less than the height of the attached end walls, said locking flaps having locking surfaces on the free edges thereof which are folded outwardly of said tray component;

(c) locking tabs formed in the upper edges of each end wall at each corner of the tray beneath the ends of said locking flaps, said locking tabs comprising tab elements which are formed by paired, spaced apart and parallel cut lines, one of each pair being located at each respective corner of the tray, which extend from cut lines at the upper edge of each end wall located along the fold lines between the end walls and the locking flaps to score lines located within the upper end of each end wall, said tab elements being folded inwardly of the end walls about said score lines to engage the side walls of the tray and retain said side walls and end walls in an upright condition for filling;

(d) a cover component including a top wall, opposed pairs of side walls and opposed pairs of end walls, said walls extending downwardly from said top wall and connected together at each corner by corner flaps foldably attached to the side walls and bonded to the inside of said end walls;

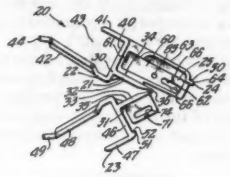
(e) said corner flaps comprising combination glue flaps/-locking flaps each of which has a cut away area at the top thereof to form locking surfaces that are equal in distance from the top of the cover component to the height of the locking flaps on the tray component so that the locking surfaces of the tray component abut the locking surfaces of the cover componenet when the two components are fully telescoped one within the other, said cover component further containing removable tab elements in the upper edges of each end wall adjacent to the point where the end walls are connected to the top wall for permitting access to and release of the locking surfaces of the locking flaps of the tray and cover components, said removable tab elements being defined by perforated lines in the end walls of the cover component having the same general shape as the locking flaps of the tray component.

4,531,670

COMBINATION CLIP AND SEAL CONSTRUCTION FOR SHIPPING CONTAINERS

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014

Filed Jun. 18, 1984, Ser. No. 621,802
Int. Cl.³ B65D *45/00*
U.S. Cl. 229—45 R **2 Claims**



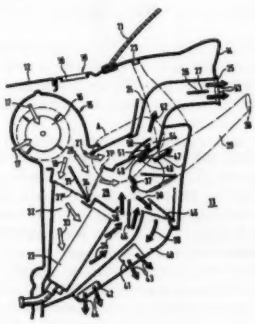
1. In a combination container and cover therefore having a pair of selectively abuttable walls having aligned openings therein, and an expandable clip simultaneously engaging the edges of said aligned openings to maintain said walls in abutted relation, said clip having first and second sections relatively movable between a first position in which the overall size of the clip is relatively diminished and a second position in which the overall size is relatively enlarged to engage said edges of said openings in said container about a transversely extending pivotal axis, said clip having a plurality of openings therein which are placed in alignment when said clip is in said second position; and elongated seal means penetrating said last-mentioned openings to prevent movement of said sections from said second position, the improvement comprising: said clip having a plurality of alignable sets of openings of different configuration, whereby, at the option of the user, seals of different configuration may be selectively engaged in one of said alignable sets of openings.

4,531,671

HEATING AND VENTILATING SYSTEM FOR THE OCCUPANT COMPARTMENT OF A MOTOR VEHICLE

Wolfgang Schwenk, Hünfelden, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1984, Ser. No. 627,181
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323176
Int. Cl.³ B60H *1/02*
U.S. Cl. 237—12.3 B **8 Claims**



1. Heating and ventilating system for the occupant compartment of motor vehicles, including a blower supplied with

ambient air, a hot air duct extending past a heat exchanger, a cold air bypass, a mixing chamber, controllable valves and doors and air vents or air discharge nozzles disposed in the area of a dashboard and leg room for the occupants, wherein air currents of different temperatures are traversing in ducts mounted adjacent to one another, and wherein, for the purpose of mixing the air currents with one another, an opening is provided between the adjacent ducts which is adapted to be closed by a flap valve, the improvement comprising:

flap valve means responsive to the air flow rate prevailing in a first duct in a manner to cause progressive opening of the flap valve means as the flow rate increases, so that with increasing air flow rate in the first duct, a progressively increasing volume of air is permitted to pass from a second duct over into the first duct,

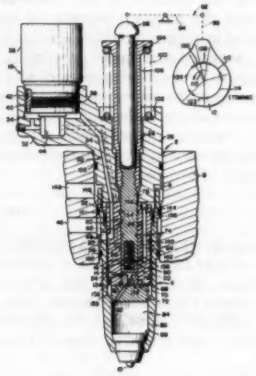
and the first duct being provided, for the purpose of creating a vacuum in the area above the flap valve means with air guide means which causes a restriction of the cross-sectional area of the first duct so that an increase in the air flow rate occurs in the narrowest cross-sectional area of the first duct.

4,531,672

SOLENOID OPERATED UNIT INJECTOR HAVING DISTINCT TIMING, METERING AND INJECTION PERIODS

Edward D. Smith, Greensburg, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 13, 1983, Ser. No. 494,434
Int. Cl.³ F02M *47/02*
U.S. Cl. 239—89 **21 Claims**



1. A fuel injector having variable metering and timing, comprising:

(a) an injector body containing an injector cavity and including a fluid timing circuit and a fluid metering circuit communicating with the injector cavity, and further including an injector nozzle communicating with one end of the injector cavity;

(b) valve means movable between an open position wherein fluid may flow therethrough to both said fluid timing circuit and said fluid metering circuit, and a closed position wherein fluid is blocked from flowing therethrough to both of said circuits; and

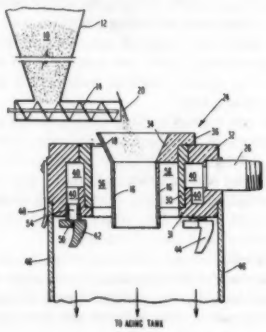
(c) plunger means mounted for reciprocal movement within the injector cavity, said plunger means comprising inner and outer plunger sections, a variable volume timing chamber being formed in said injector cavity between said inner and outer plunger sections and a variable volume injection chamber being formed in said injector cavity between said inner plunger section and an end of the injector cavity; wherein said plunger means is operable to be placed in a first condition establishing a timing period during which fluid may flow through said timing circuit into said timing chamber, but fluid is blocked thereby from flowing through said metering circuit into said metering chamber, is operable to be placed in a second condition establishing a metering period, distinct from said timing period, during which said flow into said timing chamber is blocked thereby and fluid may flow through said metering circuit into said metering chamber, and is operable to be placed in a third condition wherein fluid flow through both circuits to both said chambers is blocked thereby for producing injection of the fluid in said metering chamber through the injector nozzle; and wherein the valve means is operable independent of the condition of said plunger means; whereby said plunger means determines the chamber to which fluid passing through said valve means is delivered and said valve means is operable to control the amount of fluid delivered to the chamber determined by the condition of the plunger means.

4,531,673

SPRAY JET POLYMER POWDER WETTER

Hugh R. Holland, Cranford, and Rosario Adamo, Belleville, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 13, 1982, Ser. No. 407,689
Int. Cl.³ B05B *15/02, 15/04*
U.S. Cl. 239—113 **5 Claims**



1. Polymer powder wetting device wherein said powder is wetted without the formation of lumps and globular fish-eyes comprising

an annular nozzle holder having a central opening, said nozzle holder including an annular passageway therewithin,

a plurality of spaced nozzles secured to said nozzle holder, each of said nozzles communicating with said passageway,

an open-ended tubular insert supported by said nozzle holder and disposed centrally through said opening to form an annular space exteriorly to said insert and within said opening,

means for introducing said powder into said insert,

a cylindrical shield removably dependent from a lower peripheral portion of said nozzle holder,

means for introducing water into said passageway, said nozzles creating spray patterns from said water to induce a downward airstream in said annular space, said annular space exposed only to ambient atmosphere at its upper end,

said airstream aiding in drawing said powder through said insert and maintaining said powder in a finely divided state while falling into said spray patterns for complete wetting of said powders, and wherein one-half of said

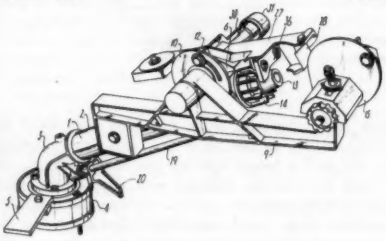
plurality of spaced nozzles have deflector planes facing radially inwardly and remainder of said nozzles have deflector planes facing radially outwardly, said nozzles with said inwardly and outwardly facing deflector planes being disposed in alternating relationship, said nozzles with inwardly facing deflector planes creating jets of high velocity water directed inwardly against said powder falling through said insert and said remaining nozzles creating jets of high velocity water directed outwardly against inner walls of said cylindrical shield.

4,531,674

IMPACT IRRIGATOR WITH CONTROLLED RETURN

Arno Drechsel, Via Weggenstein, 29, 39100 Bolzano, Italy

Filed Jun. 21, 1983, Ser. No. 506,359
Claims priority, application Italy, Jun. 24, 1982, 46837 A/82
Int. Cl.³ B05B *3/16*
U.S. Cl. 239—230 **4 Claims**



1. An impact irrigator which comprises
a swing arm mounted for rotational movement,
a rocker lever connected to said swing arm, said rocker lever being provided at its end portion with a return deflector,
a nozzle means mounted on said rocker lever for creating a water jet,
reversal linkage means operatively associated with said rocker lever for rocking said rocker lever between two positions, whereby the return deflector connected thereto is either completely outside the water jet or immersed in the water jet, said return deflector being elastically mounted through said rocker lever to elastic repositioning means whereby said return deflector is elastically positioned relative to said jet, such that the tangential thrust of the jet acting against the elastic repositioning means regulates the degree of impact or immersion of the return deflector in the water jet, said rocker lever being slidably mounted on its pivotal shaft in such a manner as to be able to move outwardly against the elastic repositioning means when the return deflector has become immersed in the water jet, said rocker lever being provided with a cam arranged to rest on the outlet nozzle of the jet in order to regulate the degree of vertical immersion of the return deflector as a function of the lateral movement of the rocker lever.

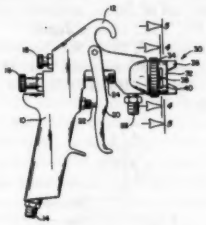
4,531,675

SPRAY NOZZLE

Jack E. Muck, Garfield Heights, Ohio, assignor to AccuSpray, Inc., Cleveland, Ohio

Filed Oct. 25, 1983, Ser. No. 545,089
Int. Cl.³ B05B *1/26*
U.S. Cl. 239—290 **8 Claims**

1. A spray nozzle for use with air atomizable liquids comprising:
a first air chamber having an outlet end;
a reciprocably mounted fluid nozzle valve having a conical taper prenetrating said first air chamber and extending to and coaxially aligned with a central circular aperture in the outlet end of said first air chamber;
means for delivering a liquid to said central aperture for atomization by air exiting said chamber through said aperture;
integral means at said outlet end for creating turbulence in the air in said chamber;



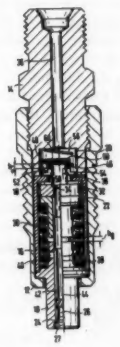
a second air chamber having an outlet end, at least two pattern adjusting nozzles disposed at the end of said second air chamber adjacent to the aperture of said first air chamber; and
a pattern adjusting plate for selectively blocking said second air chamber from said pattern adjusting nozzles.

4,531,676

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Kurt Seifert, Esslingen-Zollberg, and Karl Hofmann, Remseck, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,196
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202364; May 29, 1982, 3220398
Int. Cl.³ F02M *61/08, 61/16*
U.S. Cl. 239—453 **10 Claims**



1. A fuel injection nozzle for internal combustion engines provided with a valve needle stressed by a closing spring and arranged to open in a fuel flow direction, said valve needle further being connected with a piston associated with a damping chamber filled with fuel, said damping chamber arranged to communicate and expand only via a throttle conduit with a flow path of the fuel during an opening stroke of the valve needle, characterized in that said damping chamber is provided by a cap mounted on said piston, said cap further being supported at least after a pre-stroke (h_1) of said piston in an injection direction, said cap further having a wall section movable in an opposite direction thereto counter to the force of a restoring spring, said piston having an end face and said cap being

urged toward said end face of said piston by said restoring spring, and said movable wall section defining a bottom portion of said cap.

4,531,677

ATOMIZER

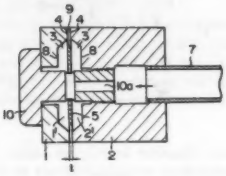
Jiro Suzuki, Nara; Hisanori Shimoda, Neyagawa, and Hisashi Kodama, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

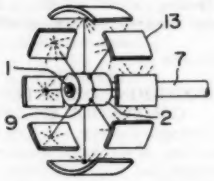
Filed Apr. 13, 1983, Ser. No. 483,206

Claims priority, application Japan, Apr. 16, 1982, 57-64295

Int. Cl.³ B05B *1/26, 1/14*

U.S. Cl. 239—520 **5 Claims**





1. An atomizer comprising

a pair of plate member defining therebetween a cavity into which pressurized liquid to be atomized is introduced, said plate members having flat peripheral regions and being spaced from each other along a longitudinal axis;

a flat plate having its thickness dimension extending in the direction of said longitudinal axis and having at least one slit extending completely through the thickness thereof, said slit having sides and said flat plate being clamped between said flat peripheral regions of said plate members so that said slit, in combination with the flat surfaces of said peripheral regions, constitutes a tetragonal nozzle port having a rectangular cross-section which provides communication between said cavity and the exterior of said plate members, whereby said nozzle port is formed by a surface of each of said plate members and the sides of said slit;

a liquid supply tube connected to the cavity between said plate members; and

a deflector disposed at the downstream side of said nozzle port.

4,531,678

INJECTION VALVE

Heinrich Knapp, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

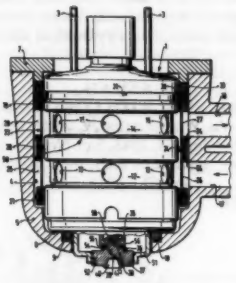
Filed Apr. 20, 1983, Ser. No. 486,775

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230671

Int. Cl.³ F02M *61/00*

U.S. Cl. 239—533.3 **2 Claims**

1. An injection valve, in particular for fuel injection systems of internal combustion engines, having a movable valve element having a concave surface arranged to cooperate with a fixed valve seat having a complementary confronting convex surface, said surfaces having the same radius of curvature over substantially their entire confronting extent, said valve further having an axis and being provided in a nozzle body, said convex surface of said fixed valve seat being provided with an annular rib for supporting said complementary surfaces in spaced relation for defining a collecting chamber therebe-



tween, said valve seat being provided with swirl conduits inclined relative to said valve axis, said swirl conduits being provided with a mouth opening into said collecting chamber disposed immediately adjacent said annular rib, said swirl conduits being arranged to exit fuel from said conduits into a preparation bore, and said annular rib has a short height so as to define a de minimis volume within said collecting chamber.

4,531,679

ELECTROMAGNETICALLY-OPERABLE FLUID INJECTION

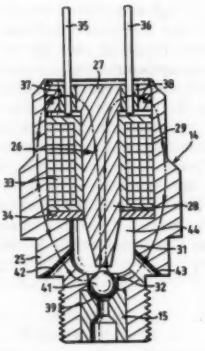
Brian C. Pagdin, Dunstable, England, assignor to Solex (U.K.) Limited, Middlesex, England

Continuation of Ser. No. 370,585, Apr. 21, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 623,535

Claims priority, application United Kingdom, Apr. 29, 1981, 8113177

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—585 **19 Claims**



1. An electromagnetically-operable fluid injector comprising:

a hollow body of magnetic material; said hollow body having a hollow interior forming a fluid inlet chamber;

a fluid inlet arrangement which communicates with the fluid inlet chamber such that fluid under pressure fed through it is fed directly into the fluid inlet chamber;

an injector nozzle which is carried by said hollow body, said

injector nozzle having top and bottom ends, said top end of said injector nozzle having a nozzle orifice and a valve seat formed around said nozzle orifice;

a conduit extending from said fluid inlet chamber to said valve seat, said conduit communicating with the chamber at a top end and with the valve seat at a bottom end;

a solenoid core connected to the hollow body and projecting into said fluid inlet chamber opposite the top end of said conduit and said injector nozzle, said solenoid core being substantially coaxially aligned with said conduit and said nozzle and tapering to a flat end surface within the fluid inlet chamber, the flat end surface being substantially flat across its entire transverse extent;

a solenoid winding wound around said solenoid core; and

a valve of magnetic material, said valve having an axial length, a portion of said valve having the greatest cross-sectional area of said valve in a direction transverse to said conduit being always located within said conduit, said valve cooperating with the valve seat to control fluid flow along a flow path from said fluid inlet arrangement through said fluid inlet chamber to said nozzle orifice;

said valve and said hollow body including the core, being in a magnetic circuit which is magnetized by energization of the solenoid winding, the valve being a movable part of the magnetic circuit and being located in a gap which is formed in that magnetic circuit between one pole, which is formed by the solenoid core, and another pole which is formed by that part of the hollow body which forms the periphery of the conduit, the valve being normally biassed to seat on the valve seat and shut off fluid flow from said fluid inlet chamber into the nozzle orifice and being unseated to allow fluid flow along said path to the nozzle orifice and thereby to effect fluid injection by change in the state of energization of the solenoid winding;

said fluid inlet arrangement communicating with said fluid inlet chamber through a portion of the hollow body without passing through said solenoid core, and said solenoid core end surface having a cross-sectional area substantially less than said greatest cross-sectional area of said valve; and

means defining a fluid restricting passageway having a top end, a bottom end and a minimum cross-sectional area, said passageway communicating with said chamber at its top end and with the valve seat at its bottom end and thereby providing a restriction in part of the flow path from said fluid inlet chamber to the nozzle orifice;

the substantially flat end surface of said solenoid core and the valve seat defining a dimension therebetween, the axial length of said valve, the dimension between the flat end of said solenoid core and said valve seat and the dimensions of the fluid restricting passageway being selected so that when the valve is fully unseated and abuts the substantially flat end surface of said solenoid core, said greatest cross-sectional area of said valve is maintained within the conduit and the distance between the valve and the valve seat is greater than the width of the minimum cross-sectional area of the fluid restricting passageway, whereby the fluid restricting passageway presents the greatest restriction to fluid flow so that when the valve is unseated the pressure differential urging the unseated valve towards the valve seat is substantially greater than it would be if there was no such restriction to fluid flow from the fluid inlet chamber to the nozzle orifice.

4,531,680

MANURE SPREADER

Ronald L. Groeneweg, 232 6th Ave., Sioux Center, Iowa 51250

Filed Apr. 6, 1983, Ser. No. 482,541

Int. Cl.³ A01C *19/00*

U.S. Cl. 239—676 **6 Claims**

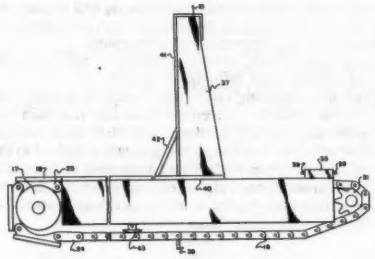
1. A manure spreading apparatus of the type having a mobile frame which can be moved over the ground, a load containing load box on the frame having upright sides wherein a rear side is modified by having a rotatable thrower which can spread a load during movement and a powered unloading mechanism for moving a load of manure toward the thrower wherein in operable combination the improvement comprises:

a reversibly moveable flexible floor at the bottom of the loadbox on the mobile frame on which a load can be supported and unloaded without relative movement between the load and the moveable floor, the reversibly moveable flexible floor further comprising:

a plurality of abutting slats transverse to the spreader's longitudinal axis, lying in a horizontal plane at the load box bottom slideably supported by the mobile frame; the length of the slats extending betwen and next to the upright sides of the load box to form a floor in the load box;

chain loops running along each side of the load box front to rear under the slats, part of which has a plurality of slat supporting links with an upper portion of each link fixed to a slat and a lower portion of each link having an idler roll engaging radius which meets the centerline of connecting pins at the ends of each link joining the links flexibly under and in line with the abutting edges of the slats which form the flexible floor so that the chain loops will not tighten and loosen as they pass over and around idler rolls;

a rear axially transverse rotary shaft having axially mounted



idler rolls with a radius like that of each slat supporting link disposed to receive them and to fix the rear location of each chain loop while permitting the slat supporting links to pass around them when movement of the chain loops is initiated;

a front axially transverse rotary shaft having axially mounted sprockets disposed to drivingly receive a portion of each chain loop forward of the headwall and flexible moveable floor through its full range of movement, longitudinally lined up with the rear idler roll, which fixes the front location of the chain loop while permitting the chain to pass around the sprockets when movement of the chain loops is initiated;

a load retaining headwall which forms an upright forward part of the flexible moveable floor and which moves with it;

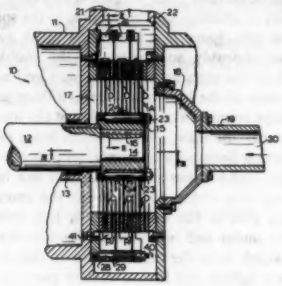
means for reversibly driving the flexible moveable floor and headwall between a front extreme position where the headwall is located away from the thrower and a rear extreme position where the headwall is located near the thrower;

control means responsive to the extreme positions of the headwall portion of the moveable floor which automatically stops the moveable floor at either extreme position of the headwall.

4,531,681
FLEXIBLE DISK REFINER AND METHOD

John B. Matthew, and Edward C. Kirchner, both of Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 18, 1983, Ser. No. 486,006
Int. Cl.³ B02C 7/14
U.S. Cl. 241—146 20 Claims



1. In an apparatus for reducing particulate material between at least one pair of radially extending relatively rotatable and axially confronting refining surfaces defining an annular gap between which the material must pass while being refined during relative rotation of said surfaces, and means for effecting flow of the material radially through said gap and across said surfaces, the improvement comprising:

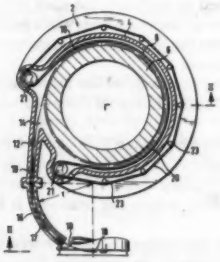
at least one of said refining surfaces in said pair comprising an annular rigid refining plate; and

a radially extending resiliently flexible mounting vane having two radially spaced portions carrying said plate and extending radially between said plate attached to one of said portions and a supporting means attached to the other of said portions, and flexing to permit substantially axial movement of said rigid refining plate for automatically adjusting said gap for attaining optimum material refining by said refining surfaces.

4,531,682
APPARATUS FOR FEEDING A WIRE FROM A COIL TO A PROCESSING STATION

Günter Schröder, Wetter; Rudolf Eichhorn, Beckingen, and Heinolf Schrader, Bruchhausen-Vilsen, all of Fed. Rep. of Germany, assignors to Deutche Gesellschaft fur Wiederaufarbeitung von Kernrennstoffen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 461,676, Jan. 27, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 662,017
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203579
Int. Cl.³ B65H 75/00, 75/12, 51/20; G03B 1/56
U.S. Cl. 242—54 R 1 Claim



1. Apparatus for feeding a welding wire from a wire coil wound on a cylindrical winding reel to a processing station, said wire coil, when removed from said reel, and in the relaxed state, forming a cylindrical spring, said reel having a diameter 2–5% larger than the diameter of said spring, said apparatus comprising

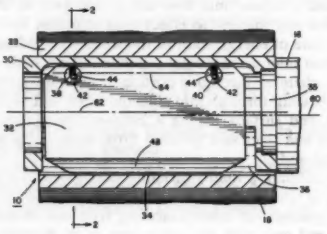
a drum-shaped housing surrounding said reel,

a guide tube through which said wire is discharged from said apparatus, said tube being tangentially connected to the periphery of said housing, and curved toward said housing with its discharge end below said housing, the radius of curvature of said tube being approximately equal to the radius of curvature of said wire in the said wire coil in the relaxed state.

4,531,683
CORE CHUCK

John R. Martin, Rockford, Ill., assignor to Martin Automatic, Inc., Rockford, Ill.

Filed Nov. 1, 1983, Ser. No. 547,756
Int. Cl.³ B65H 17/02
U.S. Cl. 242—68.3 6 Claims



1. Apparatus for releasably securing a workpiece for rotation in at least one rotational direction comprising, in combination:

a first rotatable member having an axis of rotation;

a second rotatable member mounted to the first rotatable member, having a centerline and a surface with a slot defined therein;

a rigid member having an edge and a pivotal axis; and

means for mounting said rigid member within said slot, with said pivotal axis substantially parallel to said axis of rotation, for pivotal movement about said pivotal axis between at least a first position and a second position;

both the pivotal axis and the centerline being offset from the axis of rotation of said first rotatable member away from the edge;

said edge in said first position of said rigid member co-operating with said rotatable member to wedge said workpiece for rotation, with the first rotatable member in the one rotational direction with the workpiece axis and axis of rotation being substantially coaxial;

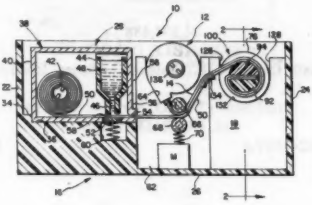
the edge in the second position of the rigid member not co-operating with the second rotatable member to wedge the workpiece;

said rigid member being pivotable between said first position and said second position by rotating said workpiece in relation to said rotatable member about said axis of rotation of said first rotatable member.

4,531,684
APPARATUS HAVING IMPROVED FILM TAKE-UP SPOOL

Loring K. Mills, Hampton, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 27, 1983, Ser. No. 565,961
Int. Cl.[3] G03B *1/04, 17/26;* B65H *75/28*
U.S. Cl. 242—71.1 6 Claims



1. Apparatus for receiving a film cassette containing a roll of photographic film including a leader which is adapted to extend to the exterior of the film cassette for attachment to a film take-up spool, said apparatus comprising:

a housing;

a loading door attached to said housing for movement between an open position, wherein a film cassette may be located within said housing, and a closed position;

means within said housing for supporting a film cassette containing a roll of film including a leader;

a film take-up spool rotatably mounted within said housing, said take-up spool having a longitudinal axis about which it is adapted to be rotated, said film take-up spool including a first member and a second member coupled to said first member for movement between a first position, wherein the leader of the film may be laid across said first member in a direction generally perpendicular to said longitudinal axis, and a second position, wherein said first and second member cooperate with each other to clamp the leader therebetween;

means for moving said second member into said second position;

means for rotating said take-up spool in a first direction so as to wind the film about said take-up spool; and

means for aiding said take-up spool in stopping its rotation in a second direction, generally opposite to said first direction, with said second end of said second member located in engagement and alignment with said moving means, whereby upon moving said loading door into said open position and said moving means away from said second member, said second member may be moved into said first position so as to facilitate the removal of the film leader from said take-up spool.

4,531,685
FILM MEDIA TAKE-UP SPINDLE WITH AUTOMATIC ENGAGEMENT PAWL

Walton L. White, Thousand Oaks, Calif., assignor to Auto Logic, Inc., Newbury Park, Calif.

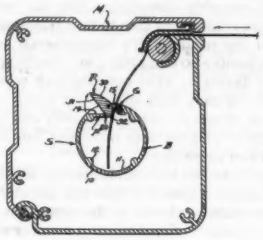
Filed Mar. 11, 1983, Ser. No. 474,355
Int. Cl.[3] B65H *75/28*
U.S. Cl. 242—74.1 16 Claims

1. A film media take-up spindle for use in power driven phototypesetter magazines, and including:

a cylinder body having outide and inside walls with an entirely open interior and having a slot opening coextensively between the ends of the cylinder body and into said interior through said outside and inside walls and with a coextensively circumferentially faced leading edge extending between the ends of the cylinder body and facing away from the direction of take-up rotation,

a supporting hub at each end of the body for rotation of the spindle and at least one of which is a drive hub to rotate the spindle, and

an anchor pawl extending coextensively between the ends of the cylinder body and alternately opening and closing the slot and comprising an elongated bar-shaped lever member carried on coaxial pivots between the supporting hubs and having a coextensive semi-circular outside wall to continue the cylinder form of the outside wall of the body and a coextensive cam face circumferentially faced in the direction of take-up rotation and spaced from the coaxial pivot axis to oppose the coextensive circumferentially faced leading edge of the slot when the anchor pawl closes

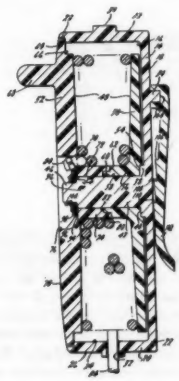


the slot and having a trailing edge spaced from the coaxial pivot axis and engageable by the film media entered through the slot and into the body a distance limited by the inside wall of the body diametrically opposite the slot when the anchor pawl opens the slot and to rotate the anchor pawl from the opened to a closed position with the film media compressively clamped between the leading edge of the slot and circumferentially opposed cam face of the anchor pawl when the film media wraps over said pawl and onto the take-up spindle, and alternately to release the anchor pawl to the opened position when the film media unwraps from the take-up spindle.

4,531,686
PORTABLE EQUIPMENT HOIST

Terrance L. Shaw, 1026 Henrickson, Clawson, Mich. 48017

Filed Sep. 14, 1983, Ser. No. 532,542
Int. Cl.[3] B65H *75/40*
U.S. Cl. 242—96 1 Claim



1. A hoist device for use by bow hunters and the like adapted to be manufactured by molding processes from a polymeric plastic material comprising:

an annular housing member having a back wall section and

a peripheral side wall section extending at a generally right angle to and integrally connected to said back wall section;

said wall sections forming an opensided annular cavity, said wall sections further forming an annular groove;

a spindle member integrally connected to said back wall section, said spindle member arranged generally centrally of said cavity and extending outwardly from said back wall section of said housing member in substantially the same direction as said side wall section;

a reel assembly rotationally disposed within said cavity and supported for rotational movement therewithin upon said spindle member;

said reel assembly comprising first and second reel side elements arranged in face to face relationship defining an annular line winding area therebetween; each of said reel side elements also comprising an annular spindle receiving section having an axial bore through which said spindle member extends, said spindle receiving sections of said reel side elements extending axially and having complementary shaped surfaces providing interfitting assembly of said reel assembly;

one of said reel side elements having an outer peripheral edge portion disposed within said annular groove and in close proximate relation to the outermost portion of said side wall section of said housing member so as to substantially enclose said cavity;

a washer which frictionally engages said spindle member thereby preventing axial disassembly of said reel assembly from said spindle member;

a line extending through one of said side elements having means secured at one end thereof for preventing disassembly of said line from said side element;

an opening in said side wall of said housing through which said line extends;

a belt clip secured to a rearward surface of said housing back section; and

a handle member extending outwardly from and substantially perpendicular to an exterior side of one of said reel side elements and formed integrally therefrom.

4,531,687

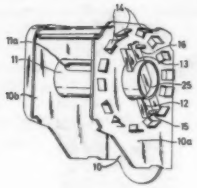
RETRACTOR REEL FOR A VEHICLE SAFETY BELT

Tommy Andersson, Alingsas, Sweden, assignor to Autoliv Aktiebolag, Vargarda, Sweden

Filed Nov. 7, 1983, Ser. No. 549,556

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **8 Claims**



1. A retractor reel for a vehicle safety belt comprising a shaft rotatably mounted on a support adapted automatically to wind in a safety belt when the belt is not in use and incorporating means for locking the shaft to prevent the belt being withdrawn from the retractor reel under certain conditions, said locking means comprising stop abutment means on said support and at least one elongate locking pin which has a longitudinal dimension and which extends through an aperture in the shaft, with the longitudinal dimension of said pin extending substantially diametrically across the shaft and substantially perpendicularly to the longitudinal axis of the shaft, the locking pin being movable in the direction of its longitudinal dimension between a retracted position and an extended locking position, the locking pin, when in the locking position, having an engagement end extending out of the shaft on one side thereof to cooperate with said stop abutment means provided on the support to prevent rotation of the shaft, the opposite end of the locking pin protruding beyond the periphery of the shaft and engaging the shaft on the side of the shaft that is remote from the engagement end of the locking pin, there being a control disk rotatably mounted on the shaft for controlling movement of the locking pin.

4,531,688

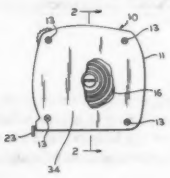
COILABLE DEVICE

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

Filed Sep. 12, 1983, Ser. No. 531,294

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107.3 **15 Claims**



1. A device for supporting a replaceable coilable member for extension and recoiling, comprising:

a separable casing having opposing walls, said casing having an aperture through which a coilable member can be extracted and retracted, said casing having an interior portion adapted to support a first reel for rotation;

a first reel rotatably supported in said casing on said interior portion, said first reel retaining a spring having one end secured thereto, said first reel being adapted to rotatably support a second reel within said casing; and

a second reel supported in said casing by said first reel for rotation with and axial movement relative to said first reel during recoiling of said coilable member, said second reel supporting said coilable member within said casing and being removably mounted within said casing for replacement of said second reel and coilable member as a unit with another second reel and coilable member, said coilable member having one end secured to said second reel and the other end extending through said aperture in said casing;

said first and second reels having positive engagement means for rotation of said reels together, said positive engagement means permitting said relative axial movement between said first and second reels.

4,531,689

VACUUM PROBE FOR ATTACHING TAPE TO REEL HUB WITHIN A CARTRIDGE

Laurence R. Beach, Jr., Tucson, Ariz.; William G. Rance, Jr., West Palm Beach, Fla.; Paul H. Whittington, and William O. Wightman, Jr., both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,947

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—195 **5 Claims**

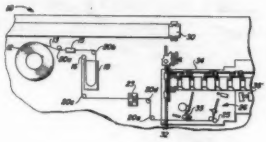
1. In a machine for automatically winding tape on a reel mounted within a substantially closed cartridge,

a probe assembly for selectively attaching an end section of the tape to an adhesive layer on the reel hub including an extension having vacuum means therein for retaining the tape and a resilient end portion for selectively engaging the hub of the reel to adhere the tape to the adhesive layer,

first drive means for selectively extending the extension from a first position wherein it is withdrawn from the cartridge to a

second position where it is inserted within a corner opening of the cartridge,

and second drive means for selectively moving the extension



laterally to cause the resilient end portion of the extension to engage and conform to the periphery of the reel hub thereby forcing the tape held thereon into firm engagement with the adhesive layer on the reel hub.

4,531,690

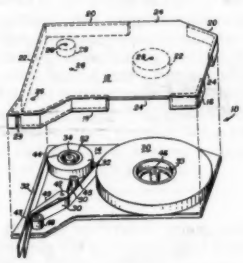
VARIABLE CAPACITY REUSABLE DUAL TAPE DISPENSING CARTRIDGE

Robert J. Condy, 128 Luray Dr., Los Gatos, Calif. 95030

Filed Mar. 12, 1984, Ser. No. 588,360

Int. Cl.[3] B41J *35/28;* G03B *1/04*

U.S. Cl. 242—197 **11 Claims**



1. A dual tape dispensing cartridge for use with a tape printing machine comprising:

a housing having a first half and a second half member, said first half member being predominantly flat and semi-rectangular with at least four flat lateral edge protrusions, a plurality of raised guide posts, a plurality of guide rings for receiving removable fasteners, said edge protrusions defining elongated slot apertures and a narrow slit aperture, said slit aperture being located on the same side as at least one slot aperture with the other slot apertures being located on independent sides from said slit aperture and from each other, said second half member being semi-rectangular with dimensions compatible with said first half member and defining at least one circular aperture positioned to correspond with at least one guide post when said half members are placed together, said second half member including at least two raised guide rings positioned about said select circular apertures in a parallel relationship with said guide rings when said first and second half members are fitted together and said guide rings defining a two-sided mounting platform upon which cylindrical structures may rotate;

a roll of adhesive backing tape rotatably mounted between two predetermined guide rings within said hollow housing;

a roll of image transferring ribbon rotatably mounted between two predetermined guide rings within said hollow cylindrical housing;

a pair of washers mounted on opposite sides of said roll of ribbon between said guide rings and said roll of ribbon so as to place said roll of ribbon under compression and create a retardent force whereby said roll of ribbon is prevented from unravelling in said housing;

a one-way roller bearing mounted about a predetermined guide post near said slit and positioned adjacent the tape path to accomodate the passage of said backing tape over the outermost surface of said bearing toward said slit, said bearing having an abrasive outer surface to resist tape movement over said outer surface when said bearing is stationary and prevents movement of said tape in the direction away from said slit;

a pawl pivotably mounted within said hollow housing about a predetermined guide post and positioned to exert pressure on said tape passing over said one-way bearing;

a spring within said hollow housing in contact with and placing tension on said pawl toward said bearing; and

fastening means in said apertures securely fastening said first and second half members together.

4,531,691

METHOD AND MEANS FOR PROTECTING AN AIRCRAFT AGAINST DISTURBANCES OF ELECTROSTATIC ORIGIN

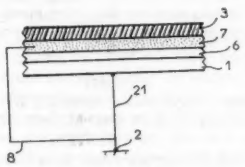
Jean-Louis Boulay; Serge Larigaldie, both of Chatenay Malabry, and Jean-Louis Reibaud, Saint Maur, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon Sous Bagneux and Avions Marcel Dassault - Breguet Aviation (AMD-BA), Vaucresson, both of, France

Continuation of Ser. No. 279,718, Jul. 2, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,074

Claims priority, application France, Jul. 3, 1980, 80 14848

Int. Cl.[3] B64D *45/02;* H01B *1/00;* H05F *3/00*

U.S. Cl. 244—1 A **17 Claims**



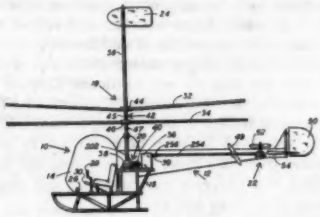
1. In a means for protecting an aircraft having its external metallic surface coated with a finishing dielectric paint, the improvement comprising: at least one layer of a resistive coating having a surface resistivity between 1 and 100 M Ω, per square and a thickness lower than 50 μm, said resistive coating being electrically connected to the electrical ground of the aircraft and continuously underlying said finishing dielectric paint, such that the electrostatic protection layer does not emerge through the finishing dielectric paint to the exterior surface thereof.

whereby there are only Corona discharges through said finishing dielectric paint, and no longer flash-over through said paint nor corresponding electrostatic discharges creeping on said exterior surface of the paint.

4,531,692
HELICOPTER FLIGHT CONTROL AND TRANSMISSION SYSTEM

Ernesto Mateus, P.O. Box 5149, Quito, Ecuador

Filed Mar. 15, 1982, Ser. No. 358,014
Int. Cl.[3] B64C *27/82, 27/10*
U.S. Cl. 244—17.19 12 Claims



1. A flight attitude control system for helicopters having horizontally disposed lift rotors mounted above the helicopter fuselage, comprising:

a substantially vertically oriented airfoil, normally aligned parallel with the longitudinal axis of the helicopter and mounted to the helicopter above the lift rotor;

pilot actuable means with said airfoil for deflecting said airfoil from its position about its vertical axis thereby inducing aerodynamic force upon said airfoil to control the helicopter's direction of flight;

a horizontally oriented elevator, pivotally mounted to the helicopter and horizontally displaced from the center of gravity of the helicopter for controlling the pitch of the helicopter;

means with said elevator for selectively deflecting said elevator about the horizontal axis of said pivotal mounting;

a horizontally disposed, variable pitch rotor mounted to the helicopter and horizontally displaced from the center of gravity of the helicopter for controlling the pitch of the helicopter;

pilot actuable means with said horizontal rotor for selectively varying the pitch of said horizontal rotor;

pilot stick control means, associated with said pitch varying means and elevator deflecting means, for actuating said elevator deflector means and said horizontal rotor pitch varying means, wherein slight to moderate deflection of said stick means causes said elevator means only to be actuated, and full or extreme deflection of said stick means causes both said elevator deflecting means and said horizontal rotor pitch varying means to be actuated.

4,531,693
SYSTEM FOR PILOTING A MISSILE BY MEANS OF LATERAL GASEOUS JETS AND MISSILE COMPRISING SUCH A SYSTEM

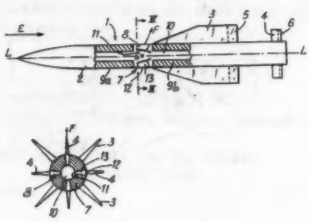
Jacques Raynaud, Savigny-sur-Orge; Jean Darmois, Bourg-la-Reine; Pierre Jolivet, Arcueil, and Jean Guillot, Chatenay-Malabry, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Nov. 10, 1983, Ser. No. 550,539
Claims priority, application France, Nov. 29, 1982, 82 19996
Int. Cl.[3] B64C *15/14*
U.S. Cl. 244—52 8 Claims

1. A steering system for a missile, said missile having a longitudinal axis and main aerodynamic surfaces disposed on its portion, said steering system comprising:

a gas generator;

lateral nozzles disposed adjacent the center of gravity of said missile and connected to the gas generator, each of said lateral nozzles being disposed at an angular position on the periphery of said missile intermediate the angular positions of an adjacent pair of said main aerodynamic surfaces, and each of said nozzles having a substantially oblong cross-section the largest dimension of which lies substantially in a plane including said longitudinal axis and the smallest dimension of which lies substantially perpendicular to said plane, each of said nozzles projecting radially outwardly beyond the fuselage of said missile in order



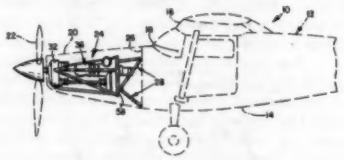
to guide a jet of gas produced by said gas generator and passing through the nozzle outside said fuselage of said missile; and

movable blanking means for controlling passage through said nozzles of the gas produced by the gas generator.

4,531,694
TURBINE ENGINE DRIVE AND MOUNTING ASSEMBLY FOR FIXED WING AIRCRAFT

Joe I. Soloy, Centralia, Wash., assignor to Soloy Conversions, Ltd., Olympia, Wash.

Filed Oct. 18, 1982, Ser. No. 435,094
Int. Cl.[3] B64D *27/10*
U.S. Cl. 244—54 6 Claims



2. A gas turbine engine power plant assembly for installation as a unit in a fixed wing aircraft or the like comprising:

an open cage-like structural support frame, including a rigid frame ring, frame struts rigidly connected at one set of ends to said ring and extending forwardly therefrom,

a gearbox having a rearwardly directed input shaft at the other forward set of ends of said frame struts,

fastening means on said gearbox and forward set of ends for detachably but rigidly connecting said gearbox to said struts,

a turboshaft gas turbine engine positioned within said frame and in inwardly spaced relation to said ring and in rearwardly spaced relation to said gearbox, said engine having a forwardly directed output shaft,

inelastic engine suspension means interconnecting said ring and engine to inelastically suspend said engine within said frame with said output shaft aligned with said input shaft, said suspension means enabling the thermal expansion and contraction of said engine relative to said frame while restraining said engine against any substantial bodily movement relative to said frame,

a drive shaft extending between said output and input shafts, and coupling means interconnecting the opposite ends of said drive shaft with the adjacent ends of said input and output shafts, said coupling means being both laterally and longitudinally flexible to accommodate the linear expansion and contracton of the drive train and slight axial misalignment of said shafts.

4,531,695

COMPOSITE HELICOPTER FUSELAGE

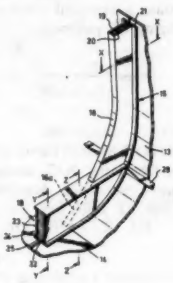
Reginald E. Swinfield, Sherborne, England, assignor to Westland plc, Yeovil, England

Filed Jan. 17, 1984, Ser. No. 571,456

Claims priority, application United Kingdom, Jan. 25, 1983, 8301991

Int. Cl.³ B64C 1/06, 1/08

U.S. Cl. 244—119 5 Claims



1. A composite helicopter fuselage includes a supporting frame structure having at least one main frame member comprising two substantially vertical side beams joined by substantially horizontal top and bottom beams, each side beam comprising a top hat section constructed of fibre-reinforced plastics material bonded to a filler material and closed by a fibre-reinforced strip bonded to the flanges of the top hat section, each of the top and bottom beams comprising two channel sections constructed of fibre-reinforced plastics material arranged back to back and bonded to a filler material and closed by fibre-reinforced plastics strips bonded to the flanges, an area at the end of each of the top and bottom beams being devoid of filler so as to permit the top hat sections of the side beams to be slotted between the channel sections, the parts being joined by bonding the internal surfaces of the channel sections to adjacent external surfaces of the top hat sections.

4,531,696

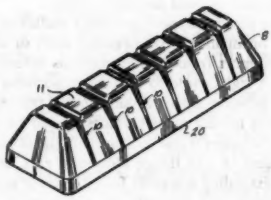
KNIFE HOLDER AND CARRYING CASE

Lyle J. Bettesworth, Kelso, Wash. 98626

Continuation-in-part of Ser. No. 119,530, Feb. 7, 1980. This application May 7, 1982, Ser. No. 375,827

Int. Cl.³ A47G 21/14

U.S. Cl. 248—37.3 5 Claims



1. A knife support and display apparatus for storing and holding a knife above a support surface comprising:

a supporting block means adapted to engage and extend upwardly from a support surface, said block means having a top surface with a plurality of slots opening upwardly there through, said slots adapted to guide entry, engage and support

the blade of a knife inserted therein, said slots having substantially rigid, opposed surfaces shaped to form:

(a) an entrance opening extending from the top of said block means and defined by sloping walls oriented in planes positioned at a first larger angle from the vertical whereby a knife blade may be guided into the slots;

(b) a throat zone below said entrance opening wherein said opposed surfaces of said slots converge at a second, smaller angle from the vertical to form an unyielding, knife blade engaging support; and

(c) an edge recess zone downwardly adjacent to said throat zone extending downwardly a depth sufficient to allow a sharpened knife edge to extend thereinto without contacting any surface while said knife is securely engaged and supported by said knife blade engaging support.

4,531,697

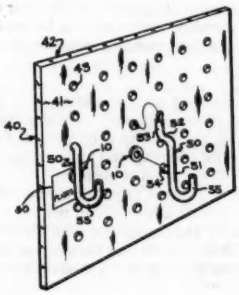
APPARATUS FOR APERTURE BOARDS

Gerald E. Steiner, and Janice A. Steiner, both of 3155 Meadowbrook Dr., Lancaster, Ohio 43130

Filed Jun. 25, 1982, Ser. No. 392,235

Int. Cl.³ E04G 3/00

U.S. Cl. 248—221.2 1 Claim



1. A stabilizer for use with an aperture board system having a plurality of spaced openings and an aperture board bracket or peg having a retaining leg for insertion in one of such spaced openings comprising, in combination:

an aperture board having a plurality of spaced openings;

an elastomeric head section for insertion in one of such spaced openings, said head section including a frustoconical portion having an outer extremity smaller than the diameter of such spaced opening for guiding said stabilizer in place within such spaced opening;

an elastomeric neck section integrally connected to said head section, said neck section, when in a relaxed condition having a diameter complementary with the diameter of such spaced opening, said head section defining a first shoulder adjacent to said neck section and extending outwardly therefrom, said first shoulder having an outer periphery greater than the circumference of such opening to anchor said stabilizer in said opening, said first shoulder being radially deflectable for insertion through such opening;

a base section integrally connected to said neck section, said base section defining a second shoulder adjacent said neck section and opposed to said first shoulder, said second shoulder having an outer periphery greater than the circumference of such spaced opening; and

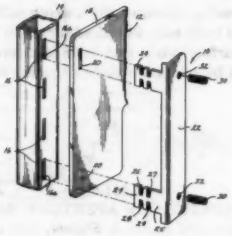
an axial recess extending from said base section through said neck section into said head section for receiving a tool during installation and said bracket or peg retaining leg after installation.

4,531,698

BRACKET FOR SECURING ADJUSTABLE SHELVING

Jerry L. Sharber, Toledo, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Jul. 27, 1982, Ser. No. 402,305
Int. Cl.[3] A47G *29/02*
U.S. Cl. 248—243 3 Claims



1. In a shelf support assembly including a vertically extending support member having at least a pair of spaced apart slots formed therein, a shelf support having a pair of spaced apart slots formed therein in alignment with the pair of slots formed in the support member, and a bracket for securing the shelf support to the support member, wherein the bracket comprises:

a main body;

a pair of spaced apart arms extending from said main body for insertion through the slots formed in the shelf support, each of said arms provided with notch means on the outer ends thereof for coupling said arms and said main body of the bracket to the support member;

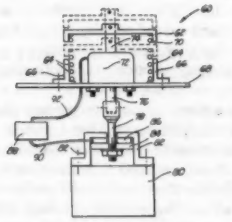
threaded adjusting means threadably mounted on said main body for longitudinal movement toward and away from said main body and engageable with the shelf support for urging the shelf support and the support member toward one another to securely fix the shelf support to the support member.

4,531,699

ACTIVE VIBRATION ISOLATOR

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 15, 1982, Ser. No. 398,673
Int. Cl.[3] F16M *13/00*
U.S. Cl. 248—550 5 Claims



1. An active vibration isolator for removing vibration between a vibration source and a payload, the isolator comprising:

a spring biasing means adapted for attachment to the vibration's source and held in compression thereagainst;

a solenoid disposed adjacent the spring biasing means and adapted for attachment to the vibration source, the solenoid having a solenoid shaft and extending outwardly therefrom, the solenoid shaft in line with the payload and vibration source, the payload suspended on the solenoid shaft and supported by the spring biasing means;

means for attaching the payload to the solenoid shaft;

a force gauge mounted on the means for attaching the payload and responsive to the movement of the solenoid shaft; and

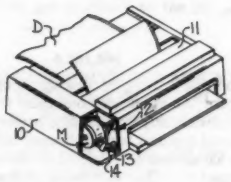
a control system electrically connected to the solenoid and the force gauge for measuring the amount of vibration force placed on the force gauge and energizing the solenoid to maintain a constant force on the force gauge thereby stabilizing the payload.

4,531,700

ELECTRIC MOTOR MOUNTING ARRANGEMENT

Carl W. Robinson, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,229
Int. Cl.[3] A47H *1/10*
U.S. Cl. 248—672 11 Claims



1. A mounting arrangement for supporting a face mounting electric motor including a motor housing with a drive shaft extending out of one end thereof, a mounting flange fixed to said housing and including a bearing surface adjacent said drive shaft, a pair of mounting ears extending outwardly from substantially diametrically opposed positions at opposite sides of said mounting flange, and mounting openings formed in said mounting ears and being concentric with said drive shaft, said mounting arrangement comprising

a support frame for supporting said electrtic motor in a right-angular position thereon,

an opening for passage of said drive shaft through said support frame,

a bearing surface on one side of said support frame and adjacent the opening and adapted to mate with said bearing surface on said mounting flange,

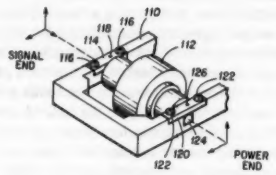
a pair of motor support members including inner portions fixed on diametrically opposed sides of said openings in said support frame, outer portions extending at substantially a right angle to said inner portions and in spaced-apart relationship with said support frame, said outer end portions having inner surfaces spaced from said one side of said support frame substantially the same distance as the thickness of said flange mounting ears, and cam projections extending inwardly from the inner surface of each of said outer end portions of said support members, said support members being sufficiently resilient that their outer portions are moved outwardly with engagement of said cam projections by said flange mounting ears,

said cam projections being positioned and dimensioned to engage the openings in said mounting flange ears with positioning of said bearing surface of said mounting flange against said bearing surface of said support frame and rotation of said electric motor and said mounting flange to resiliently maintain said mounting flange in rigidly locked position on said frame.

4,531,701
MULTISENSOR MOUNTING APPARATUS

Dennis M. Treu, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 22, 1983, Ser. No. 564,810
Int. Cl.³ G01P 1/02
U.S. Cl. 248—676 4 Claims



1. A mounting apparatus compensating for thermally-induced dimensional variance of a structure having a major longitudinal axis comprising:

a. a support fixture;

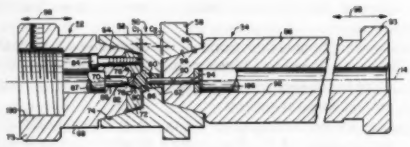
b. means for rigidly attaching a first end of said structure to said support fixture, preventing relative longitudinal movement and lateral movement therebetween; and

c. slidingly attaching means at a second end of said structure, preventing relative lateral movement; whereby longitudinal movement is allowed at said second end in a friction-reduced manner utilizing a setscrew tipped with a polymeric material.

4,531,702
INJECTION MOLD FOR FORMING OPTICAL FIBER CONNECTOR

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1982, Ser. No. 438,586
Int. Cl.³ B29D 11/00; B29C 1/14
U.S. Cl. 249—64 26 Claims



1. Precision molding assembly for forming a plastic component of the type having a body with a longitudinal axis, an end face, and a precision surface concentric with said axis and recessed behind said end face, said apparatus comprising:

first mold apparatus having a frustoconical reference surface and defining a first mold cavity portion around said axis;

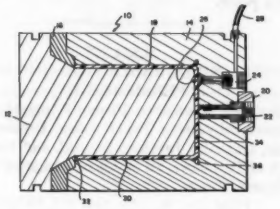
second mold apparatus having molding surfaces to define the end face and the precision surface of the component, said second mold apparatus and said first mold apparatus being movable relative to each other between opened and closed positions, said second mold apparatus having a locating surface at one end complementing said frustoconical reference surface to establish precise radial and axial orientation of said mold apparatus in said closed position; and

loading means for applying a point force along said axis to continuously urge said frustoconical reference surface of said first mold apparatus into operable position against said frustoconical reference surface of said second mold apparatus whereby said first and second mold apparatus are maintained in accurate contact such that said molding surfaces for said component are precisely positioned both concentrically and axially.

4,531,703
MOLD PERMITTING AIR EJECTION OF A FLANGED ARTICLE

J. Larry Underwood, c/o Underwood Mold Company, Inc., 104 Dixie Dr., Woodstock, Ga. 30188

Division of Ser. No. 321,570, Nov. 16, 1981,. This application Sep. 17, 1984, Ser. No. 650,687
Int. Cl.³ B29C 1/00; B29F 1/14
U.S. Cl. 249—66 A 2 Claims

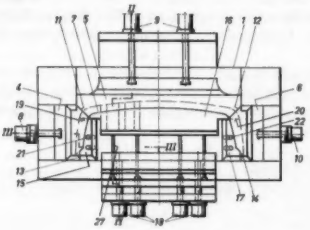


1. A mold for forming an article having a wall and a flange projecting radially outwardly therefrom, comprising a unitary mold member defining with a movable core a cavity for forming said article, an undercut provided in a first surfaces of said mold member for forming said flange, a means provided on a second surface of the mold member adjacent to the undercut for forming a flexural region in the article in proximity to the flange, and means in the second surface for supplying a fluid between the cavity and the formed article in such a volume and at sufficient pressure to maintain the article in substantially constant contact with the core as the core is removed from the cavity, the flexural region allowing the flange to conform to the wall of the cavity until the article is free from the cavity.

4,531,704
INJECTION MOLDING MACHINE

Ernst A. Matthei, Wuppertal, Fed. Rep. of Germany, assignor to Devalit-Plastik van Deest GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 564,008
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247723
Int. Cl.³ B29F 1/00, 1/14; B29C 1/00
U.S. Cl. 249—67 11 Claims



1. An injection moulding machine, particularly for the production of injection moulded parts with the parts having an exterior contour, an interior contour, a contour width and a contour depth and with the controur width being smaller in relation to the contour depth, such as where the parts are formed as motor vehicle bumpers constructed of a synthetic

material, including an injection moulding mould comprising two mould halves (1,2) displaceable relative to each other between an open position and a closed position towards and away from a closure plane of said mould halves in the closed position, a plurality of mould followers (4,5,6; 15,16,17), for forming a mould cavity and defining the external and internal contour of the injection moulded part (7), said followers being displaceably mounted on one of said mould halves transversely to the direction of movement (3) of said mould halves towards and away from the closure plane, wherein the improvement comprises that the contour depth of the injection moulded part formed by said followers extends perpendicularly to the direction of movement of said mould halves towards and away from the closure plane.

4,531,705

COMPOSITE AND DURABLE FORMING MODEL WITH PERMEABILITY

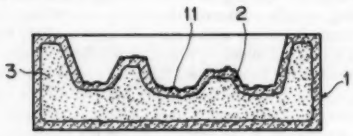
Takeo Nakagawa, Kanagawa; Hiroyuki Noguchi, Tokyo; Akira Yanagisawa, Miyashiro; Toyoji Fuma, Toyokawa; Masanobu Tsuchida, Okazaki; Takehiro Inagaki, and Yoshikazu Hayashi, both of Toyokawa, all of Japan, assignors to Sinto Kogio, Ltd., Nagoya, Japan

Filed Apr. 6, 1984, Ser. No. 597,524

Claims priority, application Japan, Apr. 22, 1983, 58-71259

Int. Cl.³ B29C *17/00, 1/00*

U.S. Cl. 249—134 **14 Claims**



1. Composite and durable forming model with permeablity, comprising a composite sintered product where aggregates are metallic grains and ceramic grains, said composite sintered product having a close hardened layer which is dispersed with metallic oxides on an outer circumference including at least a model face, and said hardened layer having fine air vents in its thickness by passing of evaporating or consumable substances contained in a binder which is mixed in the aggregates, and wherein an entire body of the model has 5 to 60% porosity and more than 100 Kg/cm^2 compression strength.

4,531,706

PRESSURE OPERATED CONTROL INSTALLATION

Günter Weiger, Esslingen; Paul Schwerdt, Freudenstadt, and Horst Grossner, Berglen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 193,443, Oct. 3, 1980, abandoned. This application Jun. 3, 1983, Ser. No. 500,813

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940112

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—25 **6 Claims**

1. A pressure operated control installation, the installation comprising

a pressure source means for supplying a pressure medium,

at least one servo member comprising

a control means for controlling a positioning of a control member,

the control means including

at least a first control block, the first control block including

a first logistor means, a control unit, a first control element coupled to the control unit, and a first bypass line means provided with a first throttling means,

the first logistor means comprising a first pressure conducting inlet means, first control inlet means and first control outlet means,

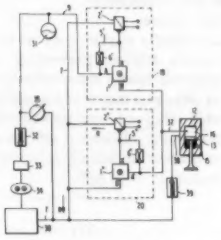
the first bypass line connecting the first pressure conducting inlet means to the first control inlet means,

the first control element adapted to control a communication between the pressure conducting inlet means of the first logistor means and the first control outlet means,

the first control means further including

a second control block comprising a second logistor means having a second pressure conducting inlet means, second control inlet means and second control outlet means, a second control element adapted to control a communication between the second pressure conducting inlet means of the second logistor means and the second control outlet means, and a second bypass line means provided with a second throttling means connected between the second control inlet means and second control outlet means,

means for connecting the control outlet means of the first logistor means of the first control block means to a second control inlet means of the second control block means



comprising means for effecting time delay by storing at least a portion of output from said control outlet means of the first logistor means and discharging at least a portion of said stored output in the absence of a signal applied to the control unit,

the control outlet means of the logistor means of the second control block means being connected to a return line means,

the second bypass line means of the second logistor means of the second control block means forming a feedback coupling to the second control inlet means, for controlling the second logistor means,

means for communicating the control outlet means of the first logistor of the first control block means to the pressure conducting inlet means of the second logistor means of the second control block means and to said servo member, and

a check valve means disposed in said communicating means and connected to the second pressure conducting inlet for preventing transmission of pressure to the control outlet means of the first logistor means.

4,531,707

PRESSURE CONTROL VALVE FOR AN OPEN HYDRAULIC CIRCUIT

Giulio Dotti, Milan; Luciano Moretti, and Ugo Costelli, both of Turin, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Jan. 15, 1981, Ser. No. 225,375

Claims priority, application Italy, Jan. 23, 1980, 67092 A/80

Int. Cl.³ F16K *31/12*

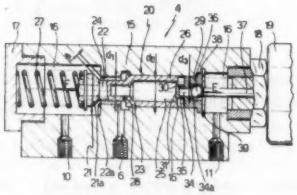
U.S. Cl. 251—44 **5 Claims**

1. A pressure control valve for use in an open hydraulic circuit which includes a source of fluid under pressure, a user device operated by the fluid under pressure, and a discharge, said control valve being positioned between said source of

fluid under pressure and said user device, said pressure control valve comprising:

(a) a valve body having an essentially cylindrical cavity therein, an inlet opening in said cavity connected to the source of fluid under pressure and to said user device, and two outlet openings in said cavity communicating with said discharge;

(b) a mobile member slidable within said cavity, a substantially conical valve element at one end of said mobile member arranged to control the opening and closing of a discharge port in said cavity lying between said inlet opening and a first of said outlet openings; said mobile member subdividing said cavity to define a first chamber into which said inlet opening debouches, and a second chamber connected to said first chamber by means of a first bore of predetermined size, said second chamber being closed at one end by a bush, said bush defining a third chamber connected to said second chamber by means of a second bore of predetermined size, the second of said outlet openings being connected to said third chamber by way of a connection port;



(c) a spring adapted to normally urge said mobile member in a direction to close said discharge port and against the action of which said mobile member is slidable in a direction toward said first outlet opening;

(d) first and second active surfaces on said mobile member arranged to be responsive to the pressure acting in said first and second chambers, respectively, in order to cause axial movement of said valve element; and

(e) interception means in said connecting port operative to control the opening of said port, said interception means being controlled by an electromagnet in response to the requirements of the user device, said interception means acting to meter in a continuous manner a continuous control flow of fluid from said inlet opening to said second outlet opening through said first, second and third chambers and said first and second bores, whereby to displace said mobile member in accordance with variations in the flow of control fluid through said second outlet orifice and hence control the flow of fluid through said first outlet orifice.

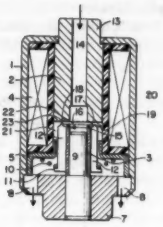
4,531,708

SOLENOID VALVE

Jean Livet, Geneva, Switzerland, assignor to Honeywell Lucifer SA, Geneva, Switzerland

Filed Aug. 21, 1984, Ser. No. 642,854
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—48 **15 Claims**

1. A solenoid valve including a movable ferromagnetic stem selectively displaceable through a magnetic field produced by an exciting current with the ferromagnetic stem having a closing device cooperating with a seat to control fluid through the valve by defining with the seat an annular sealing surface in a closed valve position characterized by a damping device comprising at least a second annular surface encompassing the annular sealing surface and separated from the annular sealing surface by a space and cooperating with a counterpart third annular surface to define an annular damping surface when the closing device is in contact with the seat and at least one fluid



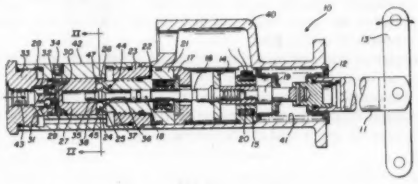
passage communicating with the space between the second and third annular surfaces.

4,531,709

HYDRAULIC CONTROL VALVE WITH FLUID DAMPENING SYSTEM

Raymond J. Maddalozzo, Chicago, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 2, 1983, Ser. No. 557,309
Int. Cl.³ F15B *13/01*
U.S. Cl. 251—48 **6 Claims**



5. A fluid dampening system for a hydraulic control valve including a spool valve intermittently movable between a neutral position and a preselected axially spaced position, and means for latching said spool valve in said preselected position, said fluid dampening system including:

means defining a fluid receiving chamber;

piston means movably disposed within the chamber;

fluid supply means for delivering fluid into said chamber;

fluid flow control means for controlling the flow of fluid from said chamber; and

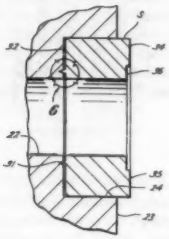
means for returning said spool valve to its neutral position from said preselected position including force generating means responsive to the movement of said spool valve towards its neutral position operable to displace said piston means to discharge fluid from said chamber through said fluid flow control means to develop a fluid reactive force acting on said spool valve to dampen movement thereof towards said neutral position, wherein said force generating means includes cam means connected to and movable with said spool valve; and

cam follower means actuated by motion of said spool valve and guided by said cam means against a confronting surface of said piston means for axially displacing said piston.

4,531,710
EXPANDING GATE VALVE

Alejandro Tort O., Mexico City, Mexico, assignor to F.I.P., S.A. De C.V., Apdo, Mexico

Filed Feb. 7, 1984, Ser. No. 576,475
Int. Cl.[3] F16K *25/00*
U.S. Cl. 251—167 7 Claims



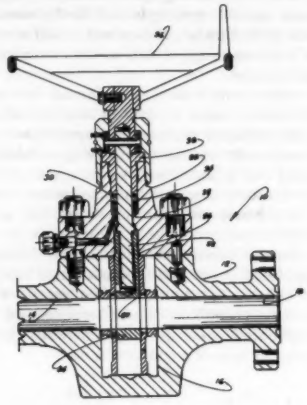
1. An expanding gate valve, comprising
a body having a guideway therein and a flowway therethrough intersecting opposite sides of the guideway,
a gate for reciprocation within the guideway to open and close the flowway, and including
a pair of gate sections having wedge-shaped surfaces on their inner sides which are yieldably urged into conformity with one another but are slidable over one another to expand their outer sides as the gate moves into its opened and closed positions,
a stem connected to one of the gate sections for so reciprocating it, and thus the other gate section carried by the one gate section,
the flowway being radially enlarged at its intersection with each side of the guideway to provide annular recesses facing the guideway, and
an annular seat mounted within each recess for sealing between the body and gate in both the opened and closed positions of the gate,
each seat comprising a ring which has at least one annular rib on its outer end which is of a harder material than the oppositely facing inner end of the recess and which is press fitted into the recess so as to embed the end of the rib into the inner end of the recess.

4,531,711
VALVE AND STEM SEAL THEREFOR

Paul D. Bunch, and Russell E. Stevens, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 30, 1982, Ser. No. 393,539
Int. Cl.[3] F16K *41/04*
U.S. Cl. 251—214 20 Claims

1. A valve comprising
a body having a chamber, an inlet and an outlet communicating into the chamber, and a valve seat surrounding said outlet and said chamber,
a valve member positioned in the chamber,
actuating means,
a valve stem connecting said actuating means to said valve member to move said valve member between positions allowing flow through said outlet and preventing flow through said outlet,
a sealing assembly between said stem and said body, and having
a resilient annular body with a plurality of internal lips for sealing against said stem and a plurality of external lips for sealing against said body, and a plurality of grooves between said internal lips and between said external lips, and
a support ring positioned radially in each of said grooves and and between each of said lips substantially filling the groove in which it is positioned to support the extremities of each of said lips above and below said support rings to prevent excessive extrusion of each of said lips,

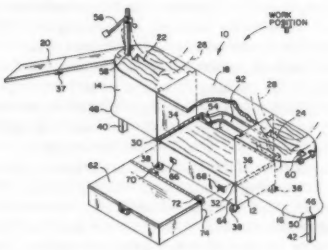


each of said lips extending slightly beyond its adjacent support rings for sealing engagement with said stem and said body.

4,531,712
CYCLE REPAIR STAND

Eric E. Christian, and George Spector, both of c/o George Spector 3615 Woolworth Bldg. 233 Broadway, New York, N.Y. 10007

Filed Sep. 21, 1983, Ser. No. 534,304
Int. Cl.[3] B60P *1/16*
U.S. Cl. 254—88 6 Claims



1. A repair stand for motorcycles and the like which comprises:
(a) a rectangular base member;
(b) a pair of hollow cast members, each hollow cast member having a tire well to support a tire of a motorcycle and hinged at one end to an opposite short side of the base member so that the hollow cast members can be placed in a storage position by being turned inwardly over the base member and can be placed in a work position by being turned outwardly away from the base member;
(c) a platform member placed between the hollow cast members when the hollow cast members are in the work position; and
(d) a ramp member attached to either of the hollow cast members when the hollow cast members are in the work position for permitting the motorcycle to be brought onto the pair of hollow cast members for repair and removed from the pair of hollow cast members when repair is

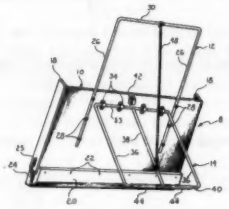
completed that further comprises a plurality of locking wheel casters mounted to the bottom of the base member making the repair stand mobile, that further comprises a pair of leg members each pivotally mounted to a free end of each of the hollow cast members to aid in supporting the hollow cast members when in the work position.

4,531,713

SNOW REMOVAL IMPLEMENT

Francis H. Balboni, P.O. Box 4, North Hatfield, Mass. 01066

Filed Jun. 8, 1984, Ser. No. 618,813
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—131.5 **4 Claims**



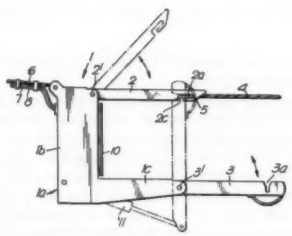
1. Snow removal implement comprising a snow pushing blade, a handle including a cross-bar portion and leg portions affixed to the backside of said blade, said handle and blade being generally coplanar, a fulcrum member disposed between the leg portions of the handle and pivotably connected to said blade, said fulcrum being a generally rectangular frame dimensioned to fit within the handle in coplanar relation therewith, said fulcrum being pivotable for movement from and to a ground engaging position at an oblique angle to the plane of the handle and blade to and from a retracted position generally coplanar with said handle, and a retrieval line extending from the handle to said fulcrum for returning said fulcrum from its ground engaging position to its retracted position.

4,531,714

STRINGING APPARATUS FOR PILOT LINES

Toralf Bahr, Greverudveien 2B, N-1415 Oppegård, Norway

Filed Sep. 27, 1983, Ser. No. 536,349
Claims priority, application Norway, Sep. 28, 1982, 823263
Int. Cl.³ H02G *1/02*
U.S. Cl. 254—134.3 R **11 Claims**



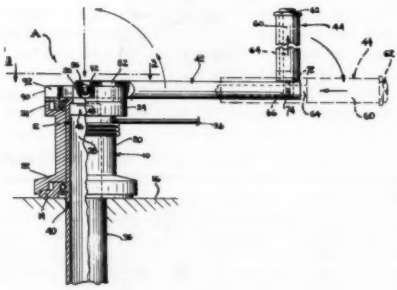
1. An apparatus for stringing a pilot line or phase line within the frame of a power line tower of H-frame, portal or corset type, utilizing a helicopter for drawing the pilot line and wherein the stringing apparatus is suspended by a strap from the helicopter and the pilot line is fastened to said apparatus, comprising a basic element that includes a forward, vertical member, with the strap fastened to the upper end thereof, and a lower, rearwardly extending horizontal member, a horizontal, rearwardly extending upper arm pivotally connected at one end to the upper end of the vertical member to permit the arm to pivot freely upwardly from the horizontal position following its release and having a downwardly open notch terminating in a recessed groove at the free end thereof, a horizontal, rearwardly extending lower arm pivotally connected at one end to the rear end of the horizontal member and having an upwardly open transverse groove at the free end thereof, means for pivoting the lower arm between a horizontal position and a vertical position wherein its groove is brought into alignment with the groove in the upper arm, a bolt fastened to the end of the pilot line, said bolt being initially retained in the groove of the upper arm, and a catch mechanism for holding the upper arm in its horizontal position until the lower arm is brought up into its vertical position whereby the bolt is transferred to the groove in the lower arm and the upper arm is released from the catch mechanism to pivot upwardly.

4,531,715

WINCH WITH STORABLE HANDLE

Ralph W. Wiens, 2021 Dufour Ave., Apartment C, Redondo Beach, Calif. 90278

Filed Jun. 11, 1984, Ser. No. 619,268
Int. Cl.³ B66D *1/00*
U.S. Cl. 254—266 **21 Claims**



1. A winch for pulling a cord and having a crank arm which is storable in the winch, said winch comprising:

(a) frame means,

(b) a spool mounted on said frame means for rotatable movement, said spool having a bore therein,

(c) a crank arm axially shiftable outwardly of the bore of said spool for use and axially into said bore of said spool for storage,

(d) a hinge means enabling said crank arm to shift to a plane angularly located with respect to the axis of said spool so that a portion extends generally radially to the axis of said spool,

(e) first locking means for releasably locking said crank arm with respect to said spool for rotating said crank arm and the spool therewith,

(f) a hand grip pivotally mounted on an end of said crank arm,

(g) a knuckle joint pivotally connecting said hand grip to said crank arm so that said hand grip is movable from a position where it is generally axially aligned with the crank arm to a position where it is angularly disposed relative to the axis of said crank arm,

(h) second locking means forming part of said knuckle joint and releasably locking said hand grip to said crank arm when the hand grip is angularly located with respect to the axis of said crank arm, and

(i) means associated with said knuckle joint to permit telescopic movement between said crank arm and said hand grip and which also permits rotatable movement of said

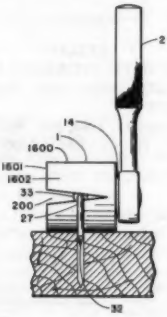
hand grip on said crank arm, said knuckle joint and said last named means cooperating to enable said hand grip to be movable from a position where it is almost completely disposed over and encircles and surrounds an outer end of said crank arm and is axially aligned with said crank arm to a position where it is located axially outwardly with respect to said crank arm and is not encircling and telescopically disposed over and surrounding the outer end of said crank arm.

4,531,716

RATCHET PULLER FOR NAILS AND STAPLES

Fred D. Rish, Joliet, Ill., assignor to Henry Ales, Joliet, Ill.

Filed Sep. 12, 1983, Ser. No. 531,322
Int. Cl.³ B66F *15/00*
U.S. Cl. 254—21 **22 Claims**



1. A ratchet puller for nails, spikes, tacks, staples and elongated members having a shank embedded in a structure from which it is to be pulled, comprising a detachable pry tool having mounting means to rotatably mount to an elongated bar, including said elongated bar, ratchet means operably connected between said pry tool and said elongated bar for ratchet operation of said pry tool, said pry tool including an outer peripheral wall, grasping means at a point along said peripheral wall to grasp a said elongated member for pulling from said structure in which it is embedded, said grasping means being rotatable through a circular path while grasping said elongated member thereby carrying said elongated member upwardly out of said structure in which it was embedded and over said peripheral wall of said pry tool as it travels in said circular path, said outer peripheral wall extending in a semi-circle for a distance of at least one hundred and eighty degrees.

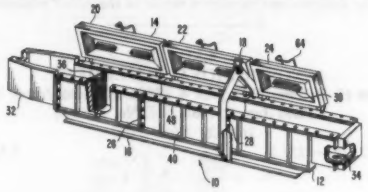
4,531,717

PREHEATED TROUGH FOR MOLTEN METAL TRANSFER

Georges Hebrant, Redmond, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 22, 1984, Ser. No. 592,330
Int. Cl.³ F27B *19/00*
U.S. Cl. 266—166 **4 Claims**

1. A segmented trough for conveying molten metal, comprising: (a) a first channel of a refractory material; (b) a second channel of a refractory material; and (c) joining means for compressively forcing said first and second channels together in an abutting end-to-end relationship so that molten metal may flow continuously from said first channel into said second channel, said joining means including loading means for resiliently applying a force and reaction means for reacting the force produced by said loading means through said channels to produce a compressive force forcing the ends of such channels together, said reaction means including two metal frames, one supporting each of said channels, and said loading means including biasing means for compressively forcing the abutting ends of said frames together, the longitudinal length of each of said channels being greater than the longitudinal length of the respective frame in which it is supported, so that the ends of said channel protrude beyond the ends of said frame, whereby



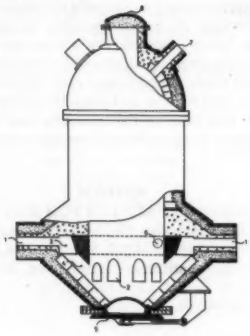
said joining means resiliently responds to changes in the length of said channels caused by thermal expansion so that the channels are not overloaded by thermal stresses, yet maintains a compressive force holding the ends of said channels together so that molten metal cannot leak from the joints between said channels.

4,531,718

IRON ORES TREATMENT APPARATUS

Arturo Lazcano-Navarro, and Antonio Villasenor-Mejia, both of Ave. Junco de la Vega #208, Colonia Roma 64700, Monterrey, Nuevo Leon, Mexico

Filed Aug. 20, 1984, Ser. No. 642,257
Int. Cl.³ F27B *1/20*
U.S. Cl. 266—186 **1 Claim**



1. An iron ore treatment apparatus for the gaseous reduction of iron ore comprising

an inverted frusto-conical base,

a cylindrical intermediate section of horizontal circular cross-section extending above said base,

a dome-like top extending above said intermediate section,

a circular gas distributor carried by said base,

duct means for introducing hot gas from said distributor through transversely variable cross-sectional channels in gaseous communication with said circular distributor,

insulated hot gas supply ducts uniformaly distributed around the base of the apparatus, having hot gas inlet ports in gaseous communication with said circular gas distributor for supplying hot gas thereto,

cooling gas entry duct means carried by said circular distributor proximate said duct means for introducing hot gas to said circular distributor,

said channels of greater cross-sectional area carried by said circular distributor being further removed from the point of gas introduction into and carried by said circular distributor than said channels of lesser cross-sectional area

also being carried by said distributor and being nearer said point of introduction of said hot gas to said distributor,

said duct means communicating said circular distributor with said transverse channels being declined at an angle of the order ranging from 35° to 45° from the horisontal,

gas outlets positioned in the upper part of said dome-like top,

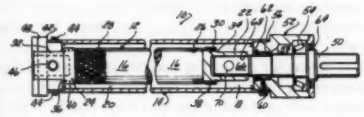
a discharge cover closing the truncated apex of said inverted frusto-conical base,

and a charging cover in the top of said dome-like top for charging the apparatus with a fixed bed of iron ore to be treated by passing said hot gas upwardly therethrough.

4,531,719
ELASTOMERIC MEMBER FOR ENERGY STORAGE DEVICE

Lyle O. Hoppie, and Richard Chute, both of Birmingham, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1983, Ser. No. 469,618
Int. Cl.³ B60G *11/18*
U.S. Cl. 267—57.1 R **2 Claims**



1. A prestressed energy storage device comprising

an elastomeric member having a main body section of substantially constant diameter, a transition section at each end thereof having a diameter smaller than said diameter of said body section, and a substantially rigid end piece affixed to each transition section;

an elongated housing having an internal passage of substantially uniform cross-sectional area configured to receive said elastomeric member in a stretched condition;

mounting means for mounting said elastomeric member within said housing in a stretched condition, said mounting means allowing one end thereof to be rotated while the other end remains fixed, to enable energy storage by windup of said elastomeric member;

said end pieces and stretched elastomeric member being of a substantially constant diameter to provide a uniform clearance between said housing opening and said stretched elastomeric member assembly; and

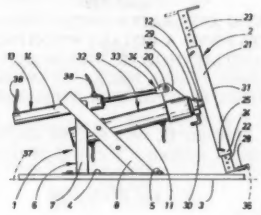
wherein each end piece has secured thereto a sleeve of helically wound wire mesh, each sleeve secured to and receiving one of said transition sections for transmitting forces effecting stretch and windup of the elastomeric member.

4,531,720
DEVICE FOR SUPPORTING WORKPIECES IN DIFFERENT POSITIONS

Sven-Harry Söder, Kinna, Sweden, assignor to Harry Söder & Son Stenhuggeri AB, Kinna, Sweden

PCT No. PCT/SE82/00336, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01436, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 18, 1982, Ser. No. 514,807
Claims priority, application Sweden, Oct. 19, 1981, 8106144
Int. Cl.³ B23Q *1/04*
U.S. Cl. 269—71 **5 Claims**

1. An apparatus for supporting a workpiece to be machined, in different positions, comprising: a work table on which the workpiece is to rest; a base member positioned at a base level, said base member comprising a fixed frame; a column which is tiltable about a first hinge on the frame, said column extending along a longitudinal axis and being a hydraulically or pneumatically expandable and retractable first piston cylinder system having a first cylinder and a piston with a first piston rod, said cylinder being pivotally mounted to said frame and said piston rod being connected to said work table, said work table being adjustable to different levels by expansion and contraction of said column and being rotatable between different rotating positions around the longitudinal axis of said column, said work table having support surfaces for the workpiece extending transversely to the longitudinal axis of the column; and a control contrivance attached between the frame and the column for adjusting the column between, and for holding the column in different tilting positions, including a lower end-

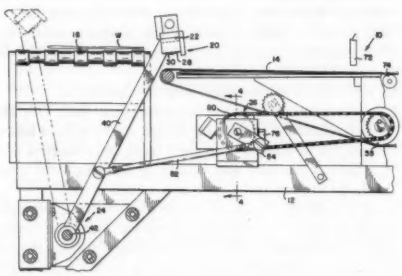


position in which the work table is obliquely positioned relative to said base level and is able to contact a portion of said base level, and from which the workpiece is raisable to a desired higher level, said worktable having two end sections telescopingly inserted into said worktable, said end sections being lockable relative to said worktable in desired positions, and carrier elements being respectively connected to said end sections and projecting from the support surfaces of said worktable in a direction away from the column for supporting and retaining a workpiece placed on said worktable in all positions of said worktable.

4,531,721
AUTOMATIC TRANSFER APPARATUS

Robert L. Kosrow, Hoffman Estates, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Oct. 26, 1983, Ser. No. 545,806
Int. Cl.³ B42C *1/00*
U.S. Cl. 270—45 **15 Claims**



1. In combination with a conveying system including a first conveyance means for moving a workpiece in a first direction, a second conveyance means arranged at one end of said first conveyance means for moving the workpiece in a second direction, workpiece pick up apparatus disposed at the interface of said first and second conveyance means, said pick up apparatus comprising:

pincer means including two relatively movable jaws capable of holding a workpiece portion therebetween;

means for moving said pincer means from a first workpiece engaging position in an arcuate path and ending in a sec-

ond position overlying the second conveyance means whereby folding the workpiece upon itself;

means operable upon said pincer means reaching the extreme limit of its arcuate movement away from said first conveyance means such that the folded over edges of the workpiece are deposited on said second conveyance means closely adjacent a longitudinal edge thereof with substantially no velocity component being imparted to the workpiece in the direction of the first conveyance means.

4,531,722

FOLDING APPARATUS RECEIVING PRINTED PRODUCTS FROM A ROTARY PRINTING MACHINE AND METHOD OF REDEPOSITION

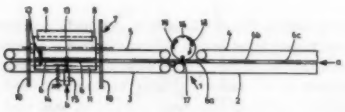
Michael Woerner, Neusiss, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,700

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325543

Int. Cl.³ B42C *1/10*

U.S. Cl. 270—47 **10 Claims**



1. Folding apparatus to receive printed products (6, 25) from a rotary printing machine

comprising the combination of

a rotary folding apparatus (7) to form a longitudinal fold in the products

with

a transport system (1, 20) removing the products from the printing machine and feeding the products to the folding apparatus

wherein the transport system feeds the products in spaced arrangement, in which the products are spaced from each other by about the linear distance of the length of a product, and

the folding apparatus comprises a roller means (11) and a folding blade (9) mounted to pass adjacent the roller means and to press a zone of the products overlying the roller means adjacent the roller means and thereby fold a product,

and wherein, in accordance with the invention,

means for providing an auxiliary transport path (16; 28–32) are provided located al_ng the transport system and positioned for removing a product from the transport path at a removal position and returning the removed product again to the transport path at a return position;

means (17–19; 26, 33) are provided for removing, selectively, each second or subsequent product from the transport system and guiding it into the auxiliary transport path,

the auxiliary transport path having a path length which is longer by at least the length of one product than the transport distance of the transport system between the removal position and the return position,

whereby, upon removal of a product and return of the removed product, the removed product will come to lie closely adjacent a neighboring product which was transported by the transport system without having been removed, to supply at least two then immediately adjacently positioned products to the rotary folding apparatus (7),

and wherein the folding apparatus (7) has an axial length which is at least as long as the overall length of the adjacently positioned products being supplied thereto by the transport system beyond the return position.

4,531,723

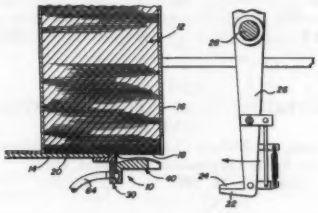
PAPER SHEET SEPARATOR

Virgil A. Watson, Salem, Iowa, assignor to Metromail Corporation, Del.

Filed Apr. 2, 1982, Ser. No. 364,788

Int. Cl.³ B65H *5/08*

U.S. Cl. 271—14 **16 Claims**



1. In combination with a magazine holding a stack of flexible sheets exposing a portion of one of the sheets for separation thereof prior to withdrawal from the stack, the improvement residing in means for deflecting said one of the sheets from the stack, comprising rigid surface means for establishing a venturi flow passage with said one of the sheets externally of the stack, nozzle means for introducing fluid under pressure into the venturi flow passage causing deflection of the one of the sheets from the stack toward the rigid surface means, and means projecting from the rigid surface means for dividing the venturi flow passage into separate flow channels.

4,531,724

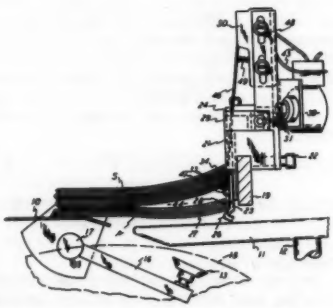
METHOD AND APPARATUS FOR CONTROLLING SHEETS IN A HOPPER

David C. Lukas, Neshanic, N.J.; James R. Moser, and James R. Schlough, both of Easton, Pa., assignors to Stobb, Inc., Clinton, N.J.

Filed Jan. 9, 1984, Ser. No. 569,295

Int. Cl.³ B65H *1/06, 3/08*

U.S. Cl. 271—166 **20 Claims**



14. Apparatus for holding sheets in a stack of sheets which are lying flat and with the sheets to be removed singly from the bottom of the stack, comprising first means for singly removing the sheets from the stack, support means disposed above said first means for moving into the stack, for holding the sheets away from said first means and developing a gap in the stack, and for moving out of the stack, for allowing the sheets to drop toward said first means, and sensing means operatively connected with said support means for sensing said gap and accordingly moving said support means out of the stack and subsequently moving said support means into the stack.

4,531,725

SHEET INVERTER

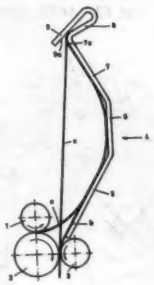
Franciscus J. H. M. Seelen, Venlo, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed May 19, 1983, Ser. No. 496,303

Claims priority, application Netherlands, Jun. 14, 1982, 8202399

Int. Cl.[3] B65H *29/00*

U.S. Cl. 271—186 11 Claims



1. A sheet inverter comprising a guide member presenting a sheet guiding surface leading to an end edge portion thereof; means for feeding a sheet forward onto and then along and over said surface so that the leading edge of the sheet will be passed in a substantially straight path over said end edge portion; and means for retarding forward movement of the sheet comprising a guide means presenting a leading edge deflecting surface disposed across and at an acute angle to said path of said leading edge and spaced a small distance away from said end edge portion so that a leading edge portion of the sheet fed over said guiding surface will be bent about said end edge portion and constrained between it and said edge deflecting surface, thereby positioning the sheet for delivery from the guide member by backward movement.

4,531,726

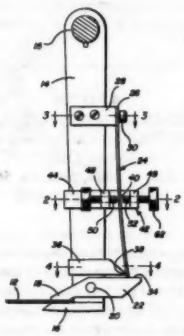
BOW SPRING DETECTOR FOR GRIPPER MECHANISM

Michael Bornstein, Claremont, Calif., assignor to Metromail Corporation, Del.

Filed Nov. 19, 1982, Ser. No. 442,952

Int. Cl.[3] B65H *7/12*

U.S. Cl. 271—263 13 Claims



1. In combination with a gripper mechanism having a movable member, a fixed jaw secured to the member, a movable jaw mounted on the member and detector means for sensing displacement of the movable jaw relative to the fixed jaw, including a contact assembly mounted on the member having spaced contact elements and feeler means engageable with the movable jaw for contact with one of the contact elements in response to said displacement of the movable jaw from the operative position, the improvement residing in said feeler means comprising an elongated leaf spring element having opposite longitudinal ends, means anchoring the leaf spring element on the member for extension between the contact elements into contact with the movable jaw, and abutment means mounted on the member in engagement with the leaf spring element for holding the same in a bowed condition while out of contact with the movable jaw.

4,531,727

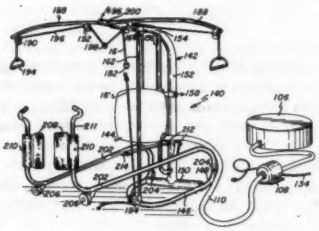
WEIGHT LIFTING EXERCISE DEVICE

John H. Pitre, Honolulu, Hi., assignor to Queststar, Eugene, Oreg.

Continuation-in-part of Ser. No. 113.210, Jan. 18, 1980, abandoned, which is a continuation of Ser. No. 846,794, Oct. 31, 1977, abandoned. This application Jul. 18, 1980, Ser. No. 170,106

Int. Cl.[3] A63B *21/06*

U.S. Cl. 272—117 25 Claims



1. An exercise apparatus, comprising:

(a) a frame having a base portion and a superstructure including a tiltable portion thereof supported by the frame for hinged movement on a substantially horizontal axis, said tiltable portion including a top member extending over the base to support a weight therefrom;

(b) a weight;

(c) elongated, flexible suspension means connected to said weight and carrying the weight from said top member;

(d) a pair of laterally extending arms, each having a first end connected to the frame for hinged movement on a substantially vertical axis and each having a user engageable second end;

(e) guide means for directing said suspension means from said weight to a position for, in use, engagement by a user at the second ends of said arms for longitudinal movement; and

(f) connecting means between said arms and said tiltable portion of the superstructure for causing the superstructure to tilt and raise said top member when the arms are moved together.

4,531,728

DUMBBELL-LIKE ADD-ON WEIGHT FOR CONVENTIONAL WEIGHT EQUIPMENT

Gregory L. Wright, Lee's Summit, Mo., assignor to Wright/Le-Chien Enterprises, Inc., Lee's Summit, Mo.

Filed Aug. 3, 1984, Ser. No. 637,550

Int. Cl.[3] A63B *11/00*

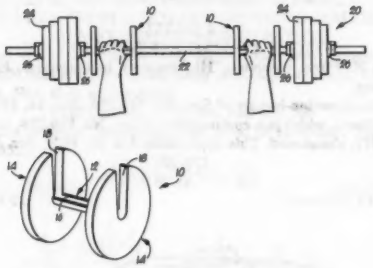
U.S. Cl. 272—122 16 Claims

1. An add-on weight training device for use with a conventional barbell having an elongated bar and weights mounted adjacent the opposed ends of the bar, said add-on device comprising:

an elongated gripping element presenting a generally concave bar-engaging surface extending along the length thereof; and

a pair of weight members having sufficient weight for use in weight training exercise respectively carried by said element adjacent the opposed ends thereof, each of said members including structure defining a slot extending from the periphery thereof to said element,

said slots being configured and arranged for receiving said bar and permitting placement of said device on the bar with said bar-engaging surface contacting the bar.



14. In a weight training method wherein a weight trainee grasps a barbell and successively lifts the same, said barbell including an elongated bar with weights affixed adjacent the opposed ends thereof, the improved method including the steps of:

positioning a pair of add-on weight training devices having sufficient weight for use in weight training exercise on said bar in spaced relationship with one another and inboard said barbell weights;

gripping both of said devices and said bar; and

lifting both said barbell and said devices together.

4,531,729

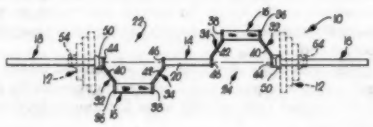
EXERCISE BAR

Rodney P. Wrinkle, Olathe, Kans., assignor to Fitness Products, Inc., Olathe, Kans.

Filed Mar. 18, 1983, Ser. No. 476,487

Int. Cl.³ A63B *13/00*

U.S. Cl. 272—123 **7 Claims**



1. An independently operable, freely movable, rotatable exercise bar for providing variable, dynamic resistive force during use thereof comprising:

an elongated central section;

a handgrip portion affixed to each end of the central section, the longitudinal axes of the central section and each of said handgrip portions being spaced apart and generally parallel with each other, said three axes being substantially coplanar, the handgrip portions being equidistantly spaced from said central section;

an outwardly extending, weight receiving member affixed to each of the handgrip portions opposite to said central section, the outer end of each of said weight receiving members being free, whereby free weights may be selectively placed over each said free end and on each of said weight receiving members and secured thereto; and

hubs for placement on each of said weight receiving members respectively, and on opposite sides of free weights thereon, for securing the free weights on their corresponding weight receiving members.

4,531,730

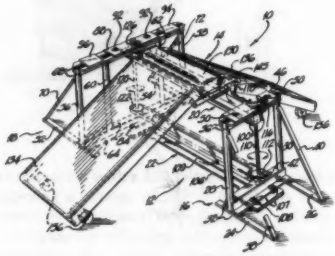
BODY STRETCHING AND EXERCISING DEVICE

Robert Chenera, 140 Walton Ave., Union, N.J. 07083

Filed Mar. 18, 1983, Ser. No. 476,766

Int. Cl.³ A63B *23/04*

U.S. Cl. 272—144 **6 Claims**



1. A novel exercise assembly upon which a human may assume a straddled position for improving leg flexibility, which comprises:

an elongated base support assembly;

a body support assembly including a center support member longitudinally disposed on said elongated base support assembly, and a first side platform having a first end portion thereof hinged to said center support member along a first longitudinal axis, said first side platform having a length sufficient to permit a second end portion of said first side platform to extend down and engage a foundation surface; and

means for lowering and raising said body support assembly between a first vertical position and a second vertical position below said first vertical position, whereby upon lowering said body support assembly from said first vertical position to said second vertical position, said first longitudinal axis is lowered, said second end portion of said first platform moves transversely along said foundation surface, and said first side platform rotates about said lowered first longitudinal axis in an angular direction away from a vertical position, said means for lowering and raising said body support assembly being operable when a human has assumed a straddle position on said exercise assembly.

4,531,731

GYMNASTIC EQUIPMENT

Denny B. Law, San Marcos, Calif., assignor to Unique Functional Products, San Marcos, Calif.

Filed Jan. 9, 1984, Ser. No. 569,278

Int. Cl.³ A61H *1/02*

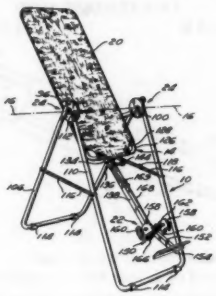
U.S. Cl. 272—145 **28 Claims**

1. The improvement in gymnastic equipment including a first equipment-supporting frame to rest on the floor and a second user-supporting frame mounted on said first frame to pivot about a horizontal pivotal axis, said second frame having a body-supporting bed and having foot-engaging means at an end of said bed, said foot-engaging means being operable to support, by the user's feet, part or all of the user's weight in various pivotally adjusted normal and inverted positions, comprising:

(a) inner, outer and intermediate circular abutting plates centered at said pivotal axis, said outer and intermediate plates having slots oriented on circular arcs in excess of

90° centered on said pivotal axis and registered throughout at least their major extents in one pivotal position thereof, and an outwardly extending abutment pin on said inner plate extending through said slots so that ends of said slots form limits on movement of said abutment pin,

(b) said outer plate being secured to said first frame and said inner plate being secured to said second frame to pivot together, and



(c) said intermediate plate having a series of locking openings disposed equidistant from said axis and said outer plate having a movable locking pin the same distance from said axis as said locking openings, said locking pin being selectively engageable in said locking openings to limit maximum backward tilting of said bed to substantially complete inversion and to limit forward tilting of said bed to less than the vertical.

4,531,732

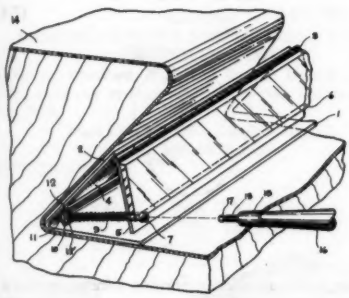
POOL TABLE RAIL-MIRROR

David W. Harris, 397 Ray St., Pleasanton, Calif. 94566

Filed Feb. 4, 1983, Ser. No. 432,316

Int. Cl.³ A63D *15/00*

U.S. Cl. 273—14 **4 Claims**



1. A pool table rail-mirror comprising:

a rail-mirror adapted to fit under and extending along the rail cushion of a pool table;

adjustment means connected to said mirror, such that said mirror may be rotated about a horizontal axis;

support means connected to said mirror and adjustment means; and

a fitting placed on the end of a cue stick and adapted to engage said adjustment means, such that said adjustment means may be operated by said cue stick.

4,531,733

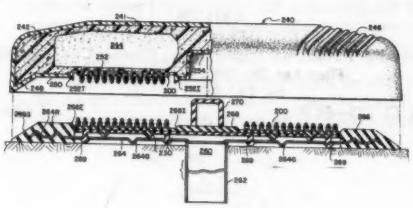
FASTENER AND BASE USING SAID FASTENER

Roger E. Hall, 100 Lakeview Dr., Elizabethtown, Pa. 17022

Continuation-in-part of Ser. No. 395,279, Jul. 6, 1982, abandoned, which is a continuation of Ser. No. 234,618, Feb. 17, 1981, abandoned, which is a division of Ser. No. 18,844, Mar. 8, 1979, Pat. No. 4,266,768, which is a continuation-in-part of Ser. No. 758,638, Jan. 12, 1977, abandoned. This application Mar. 4, 1983, Ser. No. 472,241

Int. Cl.³ A63B *71/00*

U.S. Cl. 273—25 **25 Claims**



1. A fastening element comprising:

(a) a substrate having first and second surfaces on opposite sides thereof, and

(b) a plurality of resilient connecting prongs projecting from said first surface, each connecting prong having

(i) a peripherally-extending top locking ridge,

(ii) a peripherally-extending bottom locking ridge larger than said top locking ridge,

(iii) a peripherally-extending upper recess disposed between said top locking ridge and said bottom locking ridge, and

(iv) a peripherally-extending locking recess larger than said upper recess and disposed between said bottom locking ridge and said first surface.

4,531,734

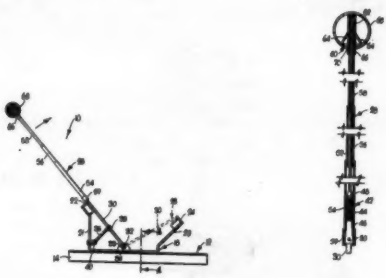
TENNIS PRACTICE DEVICE

Robert M. Herrick, 627 Grant Ave., Fort Leavenworth, Kans. 66027

Filed Jul. 30, 1984, Ser. No. 636,109

Int. Cl.³ A63B *61/00*

U.S. Cl. 273—29 A **2 Claims**



1. A device for the practice of hitting a ball, comprising:

a support;

an elongated arm;

pivot means mounting the arm on the support for swinging movement;

a ball secured to the arm remote from said pivot means;

stop means carried by the support within the path of travel of the arm for limiting the extent of swinging movement of the arm; and

elastic means interconnecting the arm and the support for yieldably biasing the arm toward one end of its swinging movement,

a portion of said arm extending from the ball toward said pivot means being flexible rendering the same bendable in response to hitting the ball,

said portion being tubular and surrounding an internal elongated wire member, said member being attached to a spring trunk in alignment therewith, said trunk including a spring rigidly secured to a pair of end elements.

4,531,735

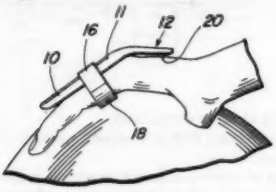
BOWLING DELIVERY REMINDER

Michael J. Kovacs, 491 Saginaw Ave., Claumet City, Ill. 60409

Filed Apr. 29, 1980, Ser. No. 133,351

Int. Cl.³ A63B *69/00*

U.S. Cl. 273—54 B **4 Claims**



1. A device removably secured to the index finger of a bowler's hand, comprising an elongated portion to seat on the upper side of the index finger, an integrally formed flat member extending angularly from the rearward end of the elongated portion to overlie and bear against the back of the hand forward of the wrist when holding a bowling ball, and strap means on said elongated portion for encircling the proximal phalanx only of the finger to secure said portion to the upper surface of the index finger.

4,531,736

ACTION CROQUET POST

John T. Sahler, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 9, 1984, Ser. No. 578,472

Int. Cl.³ A63B *63/00*

U.S. Cl. 273—56 **13 Claims**

1. A croquet post comprising:

a base;

an upstanding pole mounted on said base;

a movable target mounted on said base;

a vertically movable member slidably mounted on said pole;

latch means on said pole for engaging said movable member and releasably maintaining said member on said pole in a first position spaced above said base; and

coupling means connected to said movable target and said latch means, said coupling means responsive to movement of said target to release said latch means to allow said movable member to slide down said pole.

4,531,737

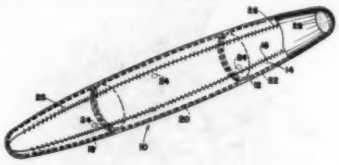
ELONGATED FOOTBALL

James Jacobson, 671 Barberry La., San Rafael, Calif. 94903, and Thomas E. McCormick, P.O. Box 698, Ross, Calif. 94957

Filed Jan. 27, 1984, Ser. No. 574,527

Int. Cl.³ A63B *43/00*

U.S. Cl. 273—65 R **5 Claims**



1. An elongated football comprising:

a casing formed of at least four elongated panels with seam lines therebetween extending end to end;

transverse partitions means within and across said casing forming three compartments in tandem in said casing; and

three inflatable bladders contained in said casing, each of said bladders being contained in one of said compartments and having an inflating valve accessible from the outside of said casing so that said bladders can be inflated to different pressures;

two of said bladders at opposite ends of said casing being generally conical;

said casing, when said bladders are inflated, being in length at least three times its maximum diameter.

4,531,738

RACQUETBALL RACQUET WITH INCREASED HITTING AREA

Raymond L. Mortvedt, Santee, and Steven M. Thompson, San Diego, both of Calif., assignors to Ektelon, San Diego, Calif.

Filed Dec. 12, 1983, Ser. No. 560,538

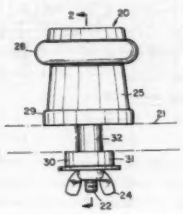
Int. Cl.³ A63B *49/12*

U.S. Cl. 273—73 C **17 Claims**

1. A racquetball racquet comprising a frame having a head connected to a handle grip so as to have an overall length of 19 to 22½ inches and a weight of 220 grams to 270 grams, said head having a strung surface of 75 to 100 square inches, the length of said strung surface in a direction along the longitudinal axis of the racquet being between 12 and 14¾ inches and between 53 and 68 percent of the length of the racquet, said strung surface having a maximum width between 9¼ and 11¼ inches in a direction generally perpendicular to said longitudinal axis, the center of gravity of the racquet being at a location within a range of ¾ inch toward the handle grip and ¼ inch toward the head as measured from the longitudinal center point of the racquet, and the center of percussion average is spaced from

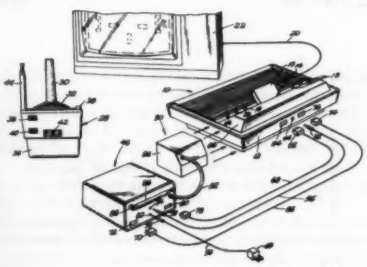
the center of gravity toward the head a distance substantially greater than 3.6 inches.

4,531,739
BUMPER FOR OUTDOOR BUMPER POOL TABLE
Edward G. Dunn, Jr., 136 E. 50th St., Indianapolis, Ind. 46205, and Edward G. Dunn, Sr., 7701 Spring Mill Rd., Indianapolis, Ind. 46260
Filed May 17, 1984, Ser. No. 611,469
Int. Cl.³ A63F 7/12
U.S. Cl. 273—127 C **7 Claims**



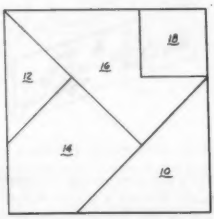
1. A bumper for use as part of an outdoor bumper pool table, said bumper comprising:
a center support hub adapted to be attached to the top playing surface of said outdoor bumper pool table;
an upper cushion disposed on said center support hub;
a lower cushion disposed on said center support hub, said lower cushion adapted to be disposed directly against said top playing surface;
fastener means for securely attaching said center support hub to said top playing surface, said fastener means including a tightening member adapted to be disposed adjacent the underside of said top playing surface; and
a hub adjustment member compressible in an axial direction and disposed between said lower cushion and said tightening member, whereby said tightening member controls the axial compression of said hub adjustment member which in turn controls the rigidity of the attachment of said center support hub to said top playing surface.

4,531,740
REMOTE CONTROL SYSTEM FOR A VIDEO COMPUTER GAME
Dan Green, Cranford, N.J., and Sandor Goldner, Brooklyn, N.Y., assignors to Cynex Manufacturing Corporation, Hillside, N.J.
Filed Jun. 22, 1983, Ser. No. 506,652
Int. Cl.³ A63F 9/22
U.S. Cl. 273—148 B **9 Claims**



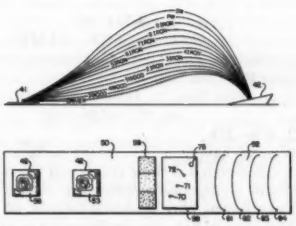
1. A remote control system for a video computer game including a master control center having a mechanical reset button, said remote control system comprising:
a portable controller unit for generating manipulation signals indicative of game movements, reset switch means on said controller unit for generating a game reset signal, and transmitter means for transmitting the manipulation signals and the game reset signal as RF signals;
receiver means for receiving said RF signals, and converter means for converting the received RF signals into control signals for application to the video computer game;
said receiver means including an actuator unit for coupling onto the master control center and converting one of said control signals representing the game reset signal into a reset control signal for operating the reset button on the master control center; and
said actuator unit including housing means for fitting onto the master control center and covering the reset button, and mechanical actuator means for mechanically operating the reset button.

4,531,741
PUZZLE
David A. Eskina, 929 SW. 11th, Moore, Okla. 73160
Filed Jun. 27, 1984, Ser. No. 625,132
Int. Cl.³ A63F 9/10
U.S. Cl. 273—157 R **1 Claim**



1. A puzzle having five interlocking pieces which can be interfitted to form a square, and which include a square piece and four pieces which can be interfitted to form a second square of smaller area then said first-mentioned square, said four pieces including two isosceles triangular-shaped pieces and a five-sided third piece having two parallel sides of equal length, a third side equal in length to the two parallel sides and extending normal to the two parallel sides, and fourth and fifth sides extending normal to each other.

4,531,742
GOLF GAME APPARATUS
Steven R. Craycraft, 3467 Halpern St., Gahanna, Ohio 43230
Filed Oct. 31, 1983, Ser. No. 546,880
Int. Cl.³ A63B 69/36
U.S. Cl. 273—176 F **11 Claims**



1. Apparatus for a golf game played by a player using a substantially constant swing with a plurality of golf clubs

having different degrees of loft on the angle of the hitting surface, varying from one club to the next, in a first series, between their hitting surface, comprising:

a. a plurality of balls all of substantially the same size incrementally varying in weight one to the next in a second series with respect to each other, the differences in weight of the balls in the second series being such that each ball may be driven the same distance, by a golfer using a substantially contant swing executed with substantially the same force, using selected ones of said differently lofted clubs of said set.

3. The apparatus of claim 1 further comprising:

b. a tee; and

c. at least one target.

4,531,743

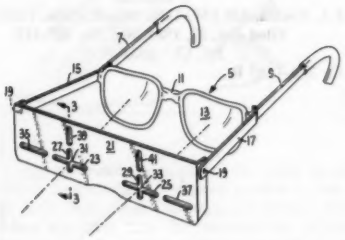
GOLFER'S AID

Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94022

Filed Dec. 17, 1983, Ser. No. 435,907

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—183 B **1 Claim**



1. A golfer's aid comprising in combination:

(a) spectacles having a frame including temple members at each side of the frame for engaging the ears of a wearer and a nosepiece adapted to engage the nose of a wearer near the wearer's face,

(b) extension arms forming extensions of each of said temple members and terminating beyond said nosepiece,

(c) a sighting aid supported at the terminal ends of said extension arms,

(d) pivoted mounting means for supporting said sighting aid whereby said aid can be swung to either a horizontal or vertical position,

(e) said sighting aid comprising a sheet of translucent material with a first pair of transparent horizontal lines and a first pair of transparent vertical lines, each pair crossing at points centered on the eyes of a wearer,

(f) said sighting aid having two additional transparent horizontal lines located at each side of said first horizontal lines, and

(g) said sighting aid having two additional transparent vertical lines, one located above each of the first vertical lines.

4,531,744

OPEN HOUSE - GAME

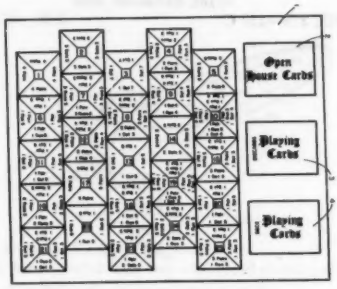
John A. Pettipas, and Albert G. Pettipas, both of 1211 Cole Harbour Rd., Cole Harbour, Nova Scotia, Canada B2V 1M9

Filed Feb. 21, 1984, Ser. No. 581,619

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—275 **3 Claims**

1. A game having a gameboard surface divided into 25 squares, color-coded in three colors and irregularly positioned thereon and contiguously connected, each square bearing a number and having playing indicia thereon, all the said squares being disposed and arranged on the board so as to form contiguous irregular lines across the board and from top to bottom and from said to side of the board, the squares being further arranged, in such a manner that it is requisite to capture at least one specifically colored square in each line, in order to form the said contiguous lines on the board and having a stylized Open House 27 card pack or deck, 25 of the said cards being consecutively numbered from 1 to 25 and identified thereon as Open House Cards and having two Wild Open House Cards identified thereon as Wild Cards and including the use of three decks of conventional cards, all said said cards being played according to the indicia on the squares and to the specific rules



of the game and having a plurality of markers, color-coded in three colors, to mark the captures of squares by the players of the game, the playing of the game being governed by rules as to discards, draws and plays of the cards, with the object of the game being to be the first player or team of players, to capture a contiguous line of squares from top to bottom, or from side to side, or across, the board, the said line having to include at least one square colored in one requisite color of the three colors which distinguish the squares.

4,531,745

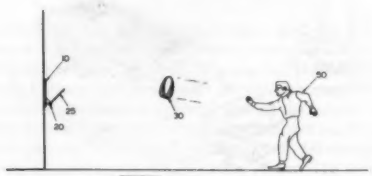
THREE FOR ALL ROPE RING TOSS DEVICE

Donald E. Leidy, 7414 School Ave., Baltimore, Md. 21222

Filed Jan. 6, 1983, Ser. No. 434,409

Int. Cl.³ A63B *67/06*

U.S. Cl. 273—336 **10 Claims**

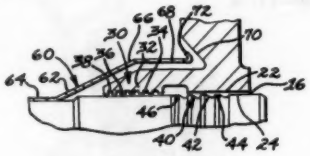


6. A game as claimed in claim 3 wherein the circular rope ring formed by three or more separate rope coils is interconnected by a flexible plastic connector.

4,531,746
DUAL LABYRINTH FLUID SEAL WITH FLUID SLINGER

John K. Amdall, and Benny Ballheimer, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/01729, § 371 Date Dec. 10, 1982, § 102(e) Date Dec. 10, 1982, PCT Pub. No. WO84/02382, PCT Pub. Date Jun. 21, 1984
PCT Filed Dec. 10, 1982, Ser. No. 648,555
Int. Cl.³ F16J 15/42, 15/44
U.S. Cl. 277--53 10 Claims



1. A seal (10) for preventing leakage of a fluid (12) from a fluid chamber (14), through a path of operative interface (16) disposed between a stationary member (18) and a rotatable member (20) and located above the level of fluid (26) in the fluid chamber (14) comprising:

first non-contacting seal means (30) disposed at the operative interface (16) and located in the stationary member (18);

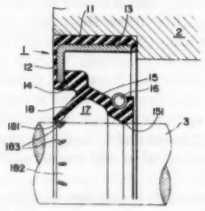
second non-contacting seal means (40) disposed at the operative interface (16) and located in the rotatable member (20) adjacent and in serial relation to said first non-contacting seal means (30); and

said first non-contacting seal means (30) being located between the fluid chamber (14) and the second non-contacting seal means (40).

4,531,747
EXTENDED WEAR ANNULAR OIL SEAL

Takeshi Miura, Fujisawa, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 438,153, Nov. 1, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,532
Int. Cl.³ F16J 15/32
U.S. Cl. 277—134 8 Claims



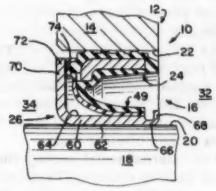
1. An oil seal in which an elastic annular sealing body having a main annular lip and an auxiliary annular lip is combined co-axially with a rotatable shaft, said main annular lip and auxiliary annular lip extending to said rotatable shaft with inclination so as to define an annular chamber between said main annular lip and said auxiliary annular lip, said auxiliary annular lip having an annular sealing edge normally in sealing contact with said rotatable shaft, comprising:

flow passage forming means, including a plurality of spaced elements provided on the inner peripheral surface of said auxiliary annular lip facing said annular chamber at locations proximal to said sealing edge of said auxiliary annular lip, for elastically deforming said auxiliary annular lip, when a vacuum is generated in said annular chamber, such that said plurality of spaced elements engage said rotatable shaft causing said annular chamber to communicate with the atmosphere thereby cancelling or compensating for said vacuum while permitting said sealing edge of said auxiliary annular lip to make sealing contact with the surface of said rotatable shaft under normal conditions in which there is no vacuum in said annular chamber.

4,531,748
FLUID SEAL WITH UNITARY WEAR SLEEVE ELEMENT

Ronald A. Jackowski, Algonquin, Ill., assignor to Chicago Rawhide Manufacturing Co., Elgin, Ill.

Filed Mar. 30, 1984, Ser. No. 595,509
Int. Cl.³ F16J 15/32
U.S. Cl. 277—153 12 Claims

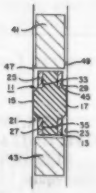


1. A unitized oil seal assembly comprising, in combination, first and second components unitized so as to permit relative rotation between them but to be fixed against unintentional disassembly, said first and second components each having thereon a surface adapted to engage a cooperating surface on an associated machine element in fluid-tight relation, with said components also cooperating with each other in use to form a primary, fluid-tight seal, said first component being a seal element which includes a one-piece rigid seal casing having a mounting flange portion and a body bonding and locating flange portion, said seal element further including a seal body unit made at least partially from an elastomer and having a bonding portion affixed to said bonding and locating flange portion of said casing, a primary sealing surface portion, and a flexible intermediate portion lying between said sealing surface portion and said bonding portion, said second component including a one-piece unitizing casing having a generally cylindrical wear sleeve portion with a wearing surface in opposed facing contact relation with said primary sealing surface portion of said seal body unit, whereby said surfaces form a fluid-tight rotary seal, with said unitizing casing further including an axially outer, radially extending protective flange with its outer edge lying radially outwardly of at least a part of said first component bonding flange, and an axially inner, radially outwardly extending locking flange having its radially outer edge extending radially beyond said sealing surface of said seal body unit, and with said sealing surface on said principal body portion being urged by the inherent resiliency of said principal body portion into said fluid-tight sealing contact with said wearing surface on said wear sleeve, said protective and locking flanges on said unitizing casing each being separated by an axial working clearance from an adjacent part of said seal body unit, whereby, in use, if relative axial movement of said first and second components exceeds said working clearance, one of said protective and locking flanges will engage a portion of said seal body unit and not a part of said seal casing portion of said first component.

4,531,749
CIRCULAR SEAL WITH INTEGRAL BACKUP RINGS

Jay W. Jackson, Huntsville, and Ruben E. Golden, Trinity, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 2, 1983, Ser. No. 500,212
Int. Cl.³ F16J 15/18
U.S. Cl. 277—188 A 2 Claims



1. A circular seal for sealing the annular clearance between an inner cylindrical member and an outer cylindrical member at pressures in the range of 2,000–7,500 psi and temperatures of 200°–400° F., comprising:

a center portion made of rubber, said center portion being generally cylindrically shaped with a raised external rib and a corresponding raised internal rib circumscribing the mid region thereof, said ribs being adapted to seal against the internal diameter of said outer cylindrical member and against the external diameter of said inner cylindrical member, respectively, to form the primary sealing surfaces of said circular seal;

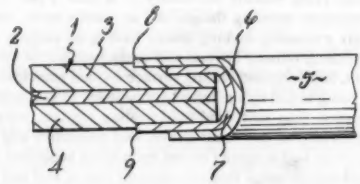
a pair of external metal backup rings and a pair of internal metal backup rings, said external backup rings being received on either side of said raised external rib and said internal backup rings being similarly received on either side of said raised internal rib; and

said raised external and raised internal ribs of said center portion being selectively sized to contact the respective internal diameter of said outer cylindrical member and the external diameter of said inner cylindrical member both before and after pressure acts on said seal and wherein said metal backup rings are undersized for said internal diameter of said outer cylindrical member and said inner cylindrical member respectively but are expandable when pressure acts on said seal to provide a zero clearance fit with said outer cylindrical member and said inner cylindrical member.

4,531,750
LAYERED GASKET WITH DOUBLE EYELET CONSTRUCTION

Maurice G. Herrington, Furnham Common, England, assignor to Payen International Limited, Slough, England

Filed Dec. 5, 1984, Ser. No. 678,757
Claims priority, application United Kingdom, Dec. 8, 1983, 8332854
Int. Cl.³ F16J 15/12
U.S. Cl. 277—235 B 3 Claims

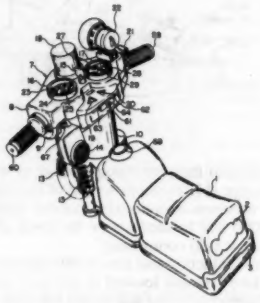


1. A gasket constituted by a flat body portion of gasket material having at least one eyeletted aperture therein, characterised in that the eyelet is a composite one having an inner and outer portion, said portions being so disposed that on one face of the gasket body material, the inner portion projects beyond the outer portion, and that on the other face of the gasket body material, the outer portion projects beyond the inner portion.

4,531,751
TOY MOTORCYCLE

Masatoshi Todokoro, 2-33 Koganehara 2-chome, Matsudo-shi, Chiba 270, Japan

Filed Apr. 10, 1984, Ser. No. 598,583
Int. Cl.³ B62M 1/00
U.S. Cl. 280—1.11 R 4 Claims



1. A toy motorcycle, comprising in combination:

(a) a seat unit having defined front and rear portions;

(b) a projection (4) extending from the front portion of the seat unit with a vertical cylinder (10) fitted around the projection (4), a handlebar unit (7) mounted so as to turn left and right on said cylinder, said handlebar unit having an upper portion thereon an imitation key (15), an imitation speedometer (16), an imitation fuel gauge (17), with an aperture in said speedometer and said fuel gauge, an imitation flasher (18), two defined opposite sides to said handlebar unit with a handlebar affixed to each of said two sides, a rotatable grip (58) mounted on each one said rotatable grip handlebar, a fixed grip (60) mounted on the other handlebar, having a drive shaft (42) affixed thereto;

(c) a simulated motor (40) with a frame (41) located within said one handlebar, said drive shaft (42) extending within said frame, a gear train (44, 43, 46, 48, 47) driven by said drive shaft, second shaft means (45, 37) with a projecting portion extending through said frame (41) driven by said gear train, discs (31, 34) positioned below the apertures of said imitation speedometer aperture and said imitation fuel gauge aperture, with simulated speed and fuel signals on said discs, said discs (31,34) being coupled to said second shaft means (45, 37) for rotation; and,

(d) rotatable vanes (53) in said flasher (18) with pulley and belt means (55, 57) connecting said second shaft means (45, 37) and said rotatable vanes (55) so as to turn the vanes in said flasher (18), also, a pawl (50) coupled to said gear train and acting to hit a resilient metal piece (49) which when contacted by said pawl produces a motor-like sound.

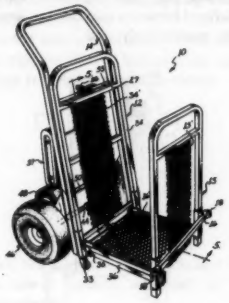
4,531,752
MANUAL UTILITY CART

Henry Diener, 71121 U.S. 131, White Pigeon, Mich. 49099

Filed Dec. 22, 1982, Ser. No. 452,067
Int. Cl.³ B62B 1/04
U.S. Cl. 280—47.18 4 Claims

1. A manual utility cart comprising a rigid wheeled frame, a wheeled carrier unit releasably connected to said frame, and means for releasably connecting said frame and carrier unit, the wheels of said carrier unit accommodating rolling travel of said carrier unit when it is detached from said frame, said frame

including rearwardly extending side members at the lower end of each side thereof, a first axle rotatably carried by said side members and journaling a wheel at each of its ends, support arms carried by said first axle for mounting a second axle parallel to said first axle, a wheel journaled at each end of said second axle, said second axle and said second named wheels being located between said first named wheels, and linkage rod



means pivotally connected at one end to said frame and eccentrically connected at its other end to a linkage arm rigidly secured to said first axle for shifting said second axle and said second named wheels between a retracted position above said first axle and a lowered position in which said second named wheels support said frame, wherein said frame is selectively supported by either said first named wheels or said second named wheels.

4,531,753

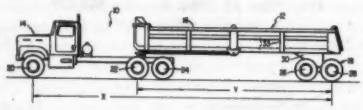
METHOD AND APPARATUS FOR VARYING A VEHICLE WHEELBASE

W. Glen Hicks, 809 Kennon St., Minden, La. 71055

Filed Nov. 4, 1983, Ser. No. 549,235

Int. Cl.[3] **B60G** *5/06;* **B62D** *27/04;* **B60P** *1/04*

U.S. Cl. 280—80 B **16 Claims**



1. A vehicle supported by at least one axle, comprising:

a frame;

a pedestal for supporting selected ones of said axles;

means for supporting said pedestal on said frame for slidable motion of said pedestal along said frame between a forward position and a rearward position;

pedestal mounted wedge structure;

frame mounted wedge structure, the pedestal mounted wedge structure and frame mounted wedge structure moving into a wedging position when the pedestal is in the forward and rearward positions to wedge the pedestal to the frame in the forward and rearward position for vehicle operation;

locking means for urging the pedestal mounted wedging structure and frame mounted wedging structure into the wedging position when the pedestal is in the forward and rearward positions;

the vehicle being an end dump trailer, the forward position of the pedestal permitting dumping of the end dump trailer payload while the rearward position of the pedestal is employed for trailering, at least one of said axles being positioned rearward of the frame when the pedestal is in the rearward position.

4,531,754

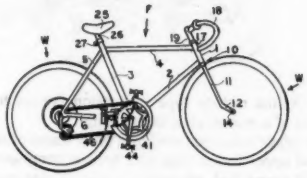
RADIAL BRAKING SYSTEM

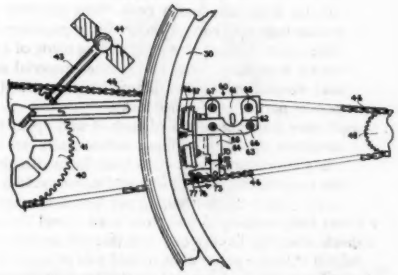
Christian F. Engleman, 213 E. Market St., Louisville, Ky. 40202

Filed Sep. 30, 1982, Ser. No. 429,181

Int. Cl.[3] **B60B** *1/14;* **B62L** *1/08, 1/14*

U.S. Cl. 280—261 **9 Claims**





1. For use with a bicycle, including a frame, wheel forks, wheels having rim and hub members and being rotably mounted in said wheel forks, sprocket and chain means for imparting rotation to at least one of said wheels, pedal means rotably mounted to said frame in operative relation with said sprocket and chain means to impart forward rotation to said sprocket upon forward pedaling of the cyclist:

A. an improved radial braking system which comprises:

1. a brake member mounted near the outer surface of one of said rim members, but normally out of contact therewith;

2. motion translation means, in operative relation with said brake member, for moving said brake member into braking engagement with the rim member;

3. power means in operative relation with said motion translation means to impart motion to said motion translation means;

4. said rim member comprising:

a. an unobstructed middle portion for the provision of maximum braking surface;

b. two wall portions; and

c. a laterally-disposed lip portion, said lip portion extending laterally of one of said wall portions, and

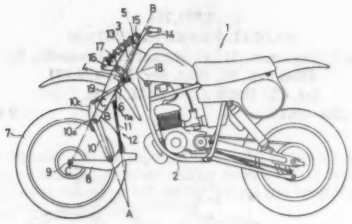
d. spoke members radiating from said laterally-disposed lip portion.

4,531,755

SUSPENSION SYSTEM FOR A FRONT ROAD WHEEL OF A MOTORCYCLE

Tokio Isono, Tokyo, and Kazuhiko Tsunoda, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,018
Claims priority, application Japan, Oct. 9, 1980, 55-141801
Int. Cl.³ B62K *19/10, 21/02*
U.S. Cl. 280—277 5 Claims



1. A link motion type suspension system for a front road wheel of a motorcycle, comprising:

an upper fork supported on a body frame of said motorcycle;

said upper fork comprising hollow component parts;

said upper fork including a pair of side members (31, 31) each comprising:

a pair of hollow outer frame members (32, 33) made of tubular materials, and a connecting member (34) for connecting said pair of outer frame members to each other, said connecting member being made of a material which is separate from said tubular material such that said connecting member defines a separate further component part of said upper fork;

said outer frame members of each of said upper fork side members together defining substantially an isosceles triangle configuration, such that the width thereof in the longitudinal direction of said motorcycle is greatest at the center of each said upper fork side member;

a lower fork supporting said front road wheel thereon;

a shock absorber having one end thereof operatively connected between upper ends of said pair of upper fork side members, and the other end thereof operatively supported at substantially intermediate front portions of said pair of upper fork side members via a pair of oscillatory arms which are connected with said lower fork;

links connecting said oscillatory arms with said lower fork;

said pair of side members of said upper fork being respectively connected at lower ends thereof to a pair of lower fork side members via a pair of front arms, and at substantially intermediate rear portions thereof via a pair of rear arms;

each of said upper fork side members being connected to a portion of said body frame at upper and intermediate portions of said side members.

4,531,756

TWO-WHEELED VEHICLE HEAD PARTS ASSEMBLY

Masami Mori, Tokyo, Japan, assignor to Mori Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 487,938
Claims priority, application Japan, Apr. 28, 1982, 57-61033[U]
Int. Cl.³ B62K *21/06*
U.S. Cl. 280—279 8 Claims

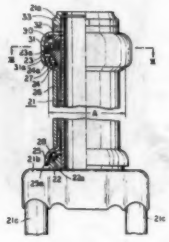
1. A head parts assembly for use in a two-wheeled vehicle, comprising:

a first pipe provided with a pair of top and bottom inner bearing surfaces;

a second pipe extending through the inside of said first pipe and having an outer peripheral surface which is threaded at least partly to define a threaded section;

a pair of top and bottom outer rings provided on said second pipe and having top and bottom outer bearing surfaces opposite to said top and bottom inner bearing surfaces, respectively, at least one of said pair of top and bottom outer rings being threaded into said threaded section;

a pair of top and bottom bearings provided in the space defined between said top inner and outer bearing surfaces and the space defined between said bottom inner and outer bearing surfaces, respectively; and



biasing means for biasing said at least one of said pair of top and bottom outer rings to maintain each of said top and bottom bearings held between the corresponding inner and outer bearing surfaces under pressure,

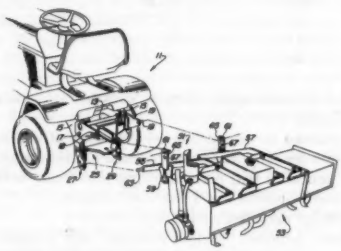
wherein said biasing means includes a spring having a first end engaged with said second pipe and a second end engaged with said top outer ring and held in place by one of a series of grooves in the inner surface of said top outer ring thereby causing said top outer ring to tend to rotate in a predetermined direction with respect to said second pipe.

4,531,757

TRACTOR HITCH ARRANGEMENT

John B. Kuhn, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed Mar. 12, 1984, Ser. No. 588,829
Int. Cl.³ B60D *1/04*
U.S. Cl. 280—461 A 2 Claims



1. A hitch assembly mounted to a tractor for supporting the attachment of an implement support structure, said hitch assembly comprising:

a rock shaft pivotally mounted to and extending transversely on said tractor, said rock shaft including a plurality of generally outwardly extending straps;

said tractor having a lower frame portion;

a plurality of clamps fixably mounted to said tractor's lower frame portion in transverse spaced apart relationship, each of said clamps including a lug fixably mounted to said tractor frame having a plurality of vertically positioned

and spaced apart seats, and a clip pivotally mounted to said lug having a plurality of vertically positioned and spaced apart generally C-shaped recesses in cooperative position to a respective one of said seats;

said implement support structure having a plurality of lift arms each of said lift arms including a pin extending from said lift arm in such a manner as to be slidably received in a respective one of said seats to be therein captured upon pivoting of said complimenting clip to be received in said C-shaped recesses; and

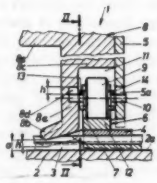
first means for selectively maintaining the relative position between said respective lug and clip upon capture of said pin in said respective seat and recess.

4,531,758

SKI BINDING

Josef Svoboda, Schwechat; Erwin Krob, and Helmut Bauer, both of Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 8, 1982, Ser. No. 447,830
Claims priority, application Austria, Dec. 11, 1981, 5305/81
Int. Cl.³ A63C *9/084*
U.S. Cl. 280—628 **11 Claims**



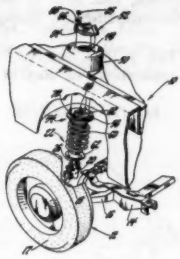
1. A heel holder comprising: a base mountable on a ski; a sole holder which is supported on said base for substantially vertical movement relative thereto between a closed position adjacent said base and an open position spaced from said base and which is supported for horizontal movement relative to said base in directions transverse to the ski; first locking means for yieldably resisting upward movement of said sole holder away from said closed position; and second locking means for resisting transverse horizontal movement of said sole holder relative to said base until said sole holder has moved upwardly a predetermined distance away from said closed position, said second locking means including a first locking part supported on one of said base and said sole holder, a second locking part supported on the other of said base and sole holder for generally vertical movement relative thereto toward and away from said first locking part, means for limiting movement of said second locking part toward said first locking part relative to said other of said base and sole holder past a first position, and resilient means for yieldably urging said second locking part toward said first position thereof, wherein said second locking means includes one of said first and second locking parts having a substantially vertically extending recess which opens toward and receives the other of said locking parts when said sole holder is in said closed position, said first locking part moving said second locking part relative to said other of said base and sole holder against the urging of said resilient means to a second position spaced a predetermined distance from said first position as said sole holder is moved to said closed position, whereby said sole holder must move upwardly said predetermined distance before said first and second locking parts move vertically relative to each other.

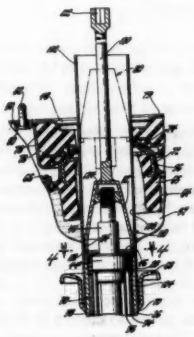
4,531,759

SUSPENSION STRUT FOR VEHICLES WITH ONBOARD SERVICE OF SHOCK ABSORBER CARTRIDGE

Richard L. Rezanka, Warren, and Bernard J. Finn, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1983, Ser. No. 520,476
Int. Cl.³ B60G *15/06*; F16F *3/08, 9/54*
U.S. Cl. 280—668 **11 Claims**





1. In a wheeled automotive vehicle having a body with suspension support structure, a serviceable vehicle suspension strut which mounts a road wheel of the vehicle to said support structure, said support structure having an access opening for servicing said strut, said strut comprising an outer support tube operatively connected to the vehicle road wheel and extending upwardly therefrom, a hydraulic shock absorber cartridge operatively mounted within said support tube and separable therefrom, said shock absorber cartridge having a piston and piston rod operatively mounted therein, a helical suspension spring having a lower end mounted to the support tube and extending upwardly therearound, an upper mount assembly for said strut, said upper mount assembly having a spring seat receiving the upper end of said suspension spring, a cylindrical jounce bumper fixed to said spring seat so that suspension jounce loads are transmitted therethrough, an elastomer mounting ring having an inner opening aligned with said access opening mounted on the underside of said support and having annular load contact with said spring seat so that said suspension spring supports the body of said vehicle, said upper mount assembly further having a cover plate assembly closing said access opening, said cover plate assembly having an upper plate disposed around said access opening and an elastomer member mounted under said upper plate for operative connection with the piston rod of said cartridge, said elastomer member providing a jounce load path for said piston rod in parallel with suspension jounce loads through said elastomer mounting ring, fastener means removably securing said cover plate as-

sembly to said support structure and said piston rod to said cover plate assembly, said cover plate assembly when removed clearing said access opening allowing access to said strut through said mount assembly so that said shock absorber cartridge can be removed and replaced by a replacement shock absorber while said road wheel remains on the road.

4,531,760

POWER STEERING FOR MOTOR VEHICLES

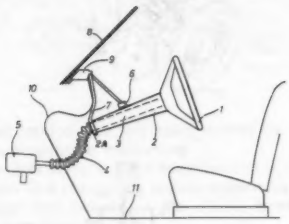
Helmut Patzelt, Kernen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,272

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245741

Int. Cl.³ B62D *1/18*

U.S. Cl. 280—777 **7 Claims**



1. Steering system for motor vehicles with a multiple-part steering column, in which a rigid steering column part in the vicinity of the steering wheel is guided in a rigid outer support tube and in which a deformable second steering column part is located between this first steering column part and the steering gear, the outer tube being fastened to a crash-resistant vehicle part by support strut means connected to the outer tube at a position spaced from the steering wheel, wherein the crash-resistant vehicle part is formed by a cross support passing directly below the vehicle windshield, and wherein the support strut means passes so closely in front of a front bulkhead bounding the vehicle interior space that the bulkhead impinges on the strut support means and reduces the length thereof in the event of rearward displacement of the bulkhead during a frontal collision or the like, whereby the steering wheel is effectively lowered.

4,531,761

APPARATUS FOR VIBRATION ISOLATION ATTACHMENT OF SUBFRAME OR AGGREGATE HOLDER

Rolf von Sivers, Rutesheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,149

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217959

Int. Cl.³ B62D *21/00*

U.S. Cl. 280—785 **20 Claims**

1. Apparatus for the vibration isolation attachment of a subframe or aggregate holder at a support member of a main frame of a motor vehicle, comprising:

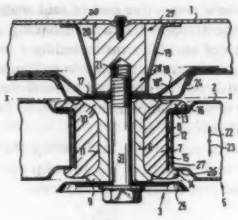
a bearing core,

an elastic bushing surrounding the bearing core,

first connecting means for connecting the elastic bushing to a first support member which is part of a vehicle subframe or the like, and

second connecting means for connecting the bearing core to a second support member which is part of a main frame of a motor vehicle,

wherein said second connecting means includes impedance increasing elements which form a vibration deflecting separation plane between the second support member and



the bearing core and which provide reinforcement to said second support member.

4,531,762

VEHICULAR SEAT BELT DEVICE

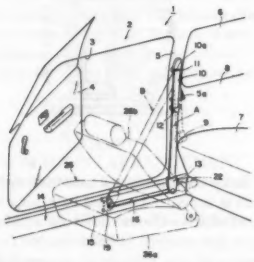
Kiichi Sasaki; Tateo Kawade, and Seiichiro Nemoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,888

Claims priority, application Japan, Sep. 25, 1981, 56-151775; Sep. 28, 1981, 56-153135

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **6 Claims**



1. In a three-way type seat belt device for a vehicle body having a door and a seat in which one end of a seat belt is secured within a retractor secured to the vehicle body, the belt passing upward from the retractor to an elevated guide ring and then downward so that the other end thereof extends to a lower part of the interior of the vehicle body, a device mounted on the vehicle centrally of the width thereof, and latch means for detachably securing an intermediate portion of the belt to said device, the improvement comprising, in combination: an inside side sill provided at the lower side of a door frame on the vehicle body, a stationary guide member extending longitudinally near the inside side sill, a slider movable along said guide member, means connecting the other end of said belt to said slider, and means for moving the slider forward and rearward in response to changes in the positions of the door and seat.

4,531,763

AERODYNAMIC BRAKING DEVICE FOR DOWNHILL SKIING

David A. Toland, P.O. Box 358, Tesuque, N. Mex. 87574

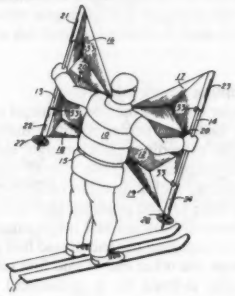
Filed Feb. 22, 1983, Ser. No. 468,574

Int. Cl.³ A65C *11/00*

U.S. Cl. 280—810 **7 Claims**

1. An aerodynamic braking device for effecting controlled downhill skiing comprising:

a sail having two substantially equal area halves symmetrical about a central vertical axis and means between said halves for connecting the inner portions thereof, the outer edges of said halves remote from said axis being straight, means for attaching respective ski poles or the like along said outer edges, said attaching means leaving generally central portions of said poles free for gripping by the user's hand and for leaving balanced areas of the sail, respectively, above and below the line between the hand-gripping positions on said poles, said sail including a second connecting means extending laterally of the sail and connecting said balanced areas of the sail,



the dimensions of the said sail being such that when said first connecting means is positioned against the front of the user's body, the user may grip the poles and hold the arms outstretched to hold the top and bottom portion of the sail taut therebetween while the sail is pressed against the user's body, and wherein said sail halves include slack open pockets secured in balanced positions on opposite sides of said central vertical axis whereby when said sail is subject to wind pressure during use said pockets are expanded thereby and extend rearwardly away from the general plane of said poles and increase the braking effect of said sail.

4,531,764

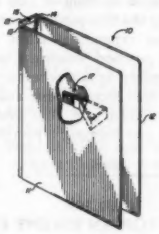
LOOSE LEAF BINDER SPACER

Kwei K. Chang, 8664 Vesta Ter., Orlando, Fla. 32825

Filed Oct. 17, 1983, Ser. No. 542,390

Int. Cl.³ B42D *3/00;* **B42F** *13/00*

U.S. Cl. 281—29 **11 Claims**



1. A loose-leaf binder having a spacer for spacing the binder covers comprising in combination:

a loose-leaf binder having a pair of covers;

a base portion attached to one cover in said loose-leaf binder;

a loose-leaf binder cover spacing portion attached to the base portion to space the loose-leaf binder covers between said base and said spacing portion, said spacing portion being adjustable between different spacing positions; and

attaching means for attaching a portion of said spacing portion in different positions to said base, said attaching means including a pair of facing surfaces, each facing surface having an attaching means portion thereon for attaching said surfaces together by pressing one facing surface to the other, thereby varying the spacing of said binder covers.

4,531,765

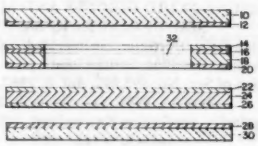
COLOR CODED ID CARDS

Joseph Shulman, Hyde Park, Mass., assignor to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Filed Dec. 29, 1980, Ser. No. 221,201

Int. Cl.³ B42D *15/02*

U.S. Cl. 283;114 **5 Claims**



1. An ID card structure comprising an information-bearing document encased within an envelope having front and back sheets of polyester material sandwiching a polyester frame member having a well opening suitable to accommodate said information-bearing document, and including a color coding arrangement comprising: a pigment dispersion in a poly-vinylidene chloride latex, said color coding arrangement being disposed between two layers of adhesive respectively supported on facing surfaces of the front sheet and the frame member and providing an adhesive bond therebetween and being disposed in such a manner so as to present a color-coded border display about the peripheral edge of said ID card structure.

4,531,766

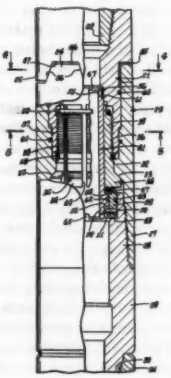
RELEASABLE COUPLINGS FOR DRILL STRINGS

Gary M. Crase, 5765 La Jolla Way, Cypress, Calif. 90630

Filed Aug. 31, 1981, Ser. No. 298,023

Int. Cl.³ F16L *55/00, 37/00, 39/00*

U.S. Cl. 285—18 **21 Claims**



15. A joint for a tubular string comprising an upper tubular member and a lower tubular member, said tubular members telescopically mounted with respect to each other, locking

member axially adjustably connected to the interior wall of one of said tubular members and extending into the other of said tubular members, said locking member formed with a foot engaging a shoulder on said other tubular member whereby on axial adjustment of said locking member with respect to said one of the tubular members, a thrust is imposed between said locking member and said other of the tubular members.

4,531,767

CONNECTING PIECE FOR A LINE OR AN APPARATUS TO BE SCREWED THEREIN TO PROVIDE A CLOSED PRESSURE-FLUID CIRCUIT AND METHOD OF MANUFACTURING SAME

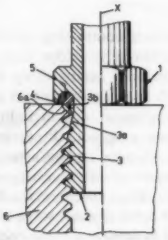
Florian Andreolla, Dottikon, Switzerland, assignor to Merzia Baumgartner, Dottikon, Switzerland

Continuation of Ser. No. 395,292, Jul. 6, 1982,. This application Jun. 14, 1984, Ser. No. 621,126

Claims priority, application Switzerland, Jul. 6, 1979, 6320/79

Int. Cl.³ F16L *5/02*

U.S. Cl. 285—220 **1 Claim**



1. A connecting piece to be screwed into a receiving part to provide a closed pressure-fluid circuit together with a sealing ring having a circular cross section, said connecting piece comprising a hollow multi-sided head and a hollow screw with a male thread, said hollow screw being in one piece with said hollow multi-sided head, an annular chamber-like recess for said sealing ring formed by said hollow screw and said hollow multi-sided head, wherein said annular chamber-like recess lies in the proximity of one end of the male thread of said hollow screw, said one end of said male thread merging smoothly and gradually into a wall of said annular chamber-like recess so as to form a guide surface in the direction of the longitudinal axis of said connecting piece for inserting said sealing ring into said recess, wherein said annular chamber-like recess is formed as a dish-shaped groove shaped to provide a close fit with said sealing ring having a circular cross section over a semicircular extent of said recess in the uncompressed state, wherein an annular wedge shaped receiving chamber is defined by said guide surface, a tapered entrance portion of said receiving part, a surface of said receiving part extending transverse to said connecting piece longitudinal axis when said connecting piece is inserted into said receiving part, and said dish shaped groove, and wherein said hollow multi-sided head further comprises me ..s for causing a portion of said sealing ring to protrude into said receiving chamber and be squeezed along the longitudinal axis of said connecting piece upon tightening of said connecting piece into said receiving part, whereby said sealing ring is held by said recess and said sealing chamber so that said multi-sided head directly contacts said receiving part when said connecting piece is fully screwed into said receiving part.

4,531,768

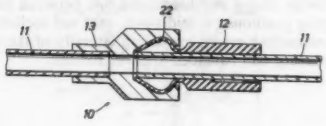
PIPE COUPLING

David P. Summers, Houston, Tex., assignor to Forerank, Inc., Houston, Tex.

Filed Dec. 2, 1982, Ser. No. 446,167

Int. Cl.³ F16L *21/00*

U.S. Cl. 285—338 **3 Claims**



1. A pipe coupling device comprising:

(a) a first tubular coupling member mounted about an end of a first pipe, said first tubular coupling member having an axial passage extending therethrough and including a centered longitudinal axis, one end of said first tubular coupling member including a circumferential lip defining the leading edge of said passage, said circumferential lip extending inwardly toward said longitudinal axis forming a shoulder for engaging the end of said first pipe extending in said passage, the other end of said first tubular coupling member being defined by a cylindrical shaft portion adapted to slidably receive said first pipe therethrough;

(b) means for securing said one end of said first tubular coupling member to the end of said first pipe engaging said circumferential lip;

(c) said first tubular coupling member including an enlarged resilient head extending from said lip to said shaft portion, said head being shaped to independently and automatically assume an enlarged and predetermined shape defining an enlarged locking configuration;

(d) a second tubular coupling member mounted about an end of a second pipe, said second tubular coupling member having an axial passage extending therethrough, one end of said second tubular coupling member being defined by an internal recess having an end wall of a diameter smaller than the maximum diameter of said enlarged head and sized to receive said enlarged head of said first coupling member for sealing engagement therewith;

(e) said head being deformable from said predetermined shape to a collapsed shape to enable insertion of said head into said recess of said second tubular coupling member; and

(f) said head respectively deforming to said collapsed shape in response to relative shifting of said first tubular coupling member along the first pipe between first and second positions, said head expanding within said recess upon return to said first position forming a sealing profile substantially corresponding to said recess and thereby joining said first pipe and said second pipe, and preventing relative movement between said first and second tubular coupling members and forming a peripheral locking seal therewith.

4,531,769

HOOK LATCH FOR AN ENGINE COWLING

Jerry L. Glancy, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 25, 1982, Ser. No. 411,418

Int. Cl.³ E05C *19/14, 5/00*

U.S. Cl. 292—113 **7 Claims**

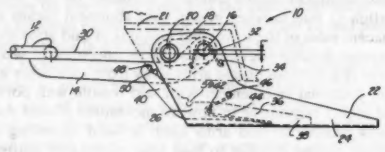
1. An improved latch for securing together a pair of hinged cowlings surrounding an aircraft engine, the latch comprising:

a latch keeper secured to one of the hinged cowlings;

a hook release handle pivotally mounted on the other hinged cowling;

a hook pivotally mounted on the hook release handle; and

a safety lock attached to the handle, the safety lock having a first securing means for engaging and securing the latch

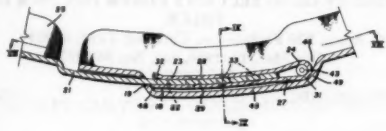


when the latch is in a locked position and a second securing means for engaging and securing the handle to the hook when the hook is unlatched from the keeper.

4,531,770
METER RING

Albert Mattress, Jr., Spencer, Mass., assignor to Norman S. Blodgett and Gerry A. Blodgett, both of Worcester, Mass.

Continuation of Ser. No. 236,987, Feb. 20, 1981, abandoned, which is a continuation of Ser. No. 945,199, Sep. 25, 1978,. This application Jan. 20, 1983, Ser. No. 459,309
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—307 R **14 Claims**

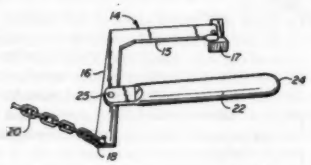


1. Meter ring, comprising:
(a) a band in the form of a thin sheet metal loop adapted to embrace an annular meter flange, said band having an intermediate portion provided with a weakened tear tab with a gripping finger for bringing about a tearing of the tab and a separation of the loop,
(b) a housing permanently attached to one end of the band, the housing being formed with an inner chamber and with a passage leading into it, the other end of the band being formed with an apertured tongue adapted to extend into the passage, and
(c) a locking member residing in the chamber and having a finger extending laterally for engagement with the aperture in the tongue, the locking member including resilient means biasing the finger toward the tongue and preventing retraction of the finger from the aperture.

4,531,771
RUG PULLER

Wilbur W. Bullock, Hayward, Calif. (Emma R. Bullock, legal representative), assignor to William M. Kinney and A. L. Bernardi, both of Oakland, Calif.

Filed Mar. 22, 1982, Ser. No. 340,573
Int. Cl.³ B66C *1/44*
U.S. Cl. 294—104 **4 Claims**

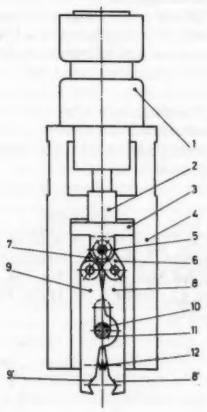


1. In combination, a roll of carpet convolutely wound in a spiral from a small diameter to larger diameters; first and second bars fastened together at a substantially right angle in an "L" configuration; said first bar having at the remote inside end of the L configuration a carpet claw; said second bar having located between the joinder of said first bar to said second bar and the remote end of said second bar a pivotal member; said pivotal member penetrating to and into the central convolute roll of said carpet and extending therefrom; means for grasping the remote end of said second bar for pulling said second bar away from said convolutely wound carpet roll whereby said claw and said pivotal member oppose one another in grasping relation to firmly hold said carpet as convolutely wound and thereafter pull said carpet as convolutely wound.

4,531,772
DEVICE FOR GRASPING, AUTOMATICALLY CENTERING AND ALIGNING THE LONGITUDINAL AXIS OF LONG BODIES ACCORDING TO THE WORKING AXIS

Umberto Ronconi, Magliaso, Switzerland, assignor to Albe S.A., Agno, Switzerland

Continuation of Ser. No. 488,641, Apr. 26, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 679,085
Claims priority, application Switzerland, Jun. 3, 1982, 3393/82
Int. Cl.³ B25J *15/00*; B66C *1/44*
U.S. Cl. 294—115 **1 Claim**



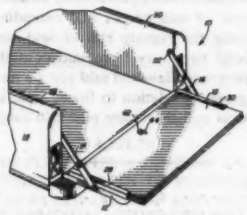
1. A device for grasping and centering automatically long bodies, comprising a support (4) having a slot (16) therein, a fulcrum pivot (10) slidable in the slot (16), a pair of elongated jaws (8,9) pivoted intermediate their ends on the pivot (10), toggle levers (6,7) pivoted one on one end of each of said jaws (8,9), a common pivot (5) interconnecting said toggle levers (6,7) at ends of said levers remote from said jaws (8,9), and means (1–3) for forcing said common pivot (5) in a direction (13) in alignment with the length of said slot (16) and toward a said body to be grasped, said levers and jaws being so disposed that said jaws close toward each other when said fulcrum pivot reaches the end of said slot nearest said body and movement of said common pivot in said direction thereafter continues, said grasping jaws having inner angled faces (8′, 9′) on their ends remote from said toggle levers (6, 7), said inner angled faces (8′, 9′) providing a V-shaped recess on said remote end of said grasping jaw (8, 9), said recesses opening toward each other for closing on and automatically centering and grasping a said long body.

4,531,773

VEHICLE TAILGATE EXTENSION ASSEMBLY

Gareth J. Smith, 15533 Tupper St., Sepulveda, Calif. 91343

Filed Dec. 23, 1983, Ser. No. 565,223
Int. Cl.[3] B62D *33/08*
U.S. Cl. 296—26 12 Claims



1. An improved vehicle tailgate extension assembly, said assembly comprising, in combination:

(a) a container having in the hauling mode an open front and top, and closed sides, rear and bottom, said container comprising plurality of generally flat interconnected panels, including:

i. a bottom bed panel,

ii. a rear panel hinged to the rear end of said bed panel and moveable between a position overlying said bed panel, a vertical hauling position above said bed panel and a position hanging below and behind said bed panel, and

iii. a pair of side panels hinged to opposite sides of said rear panel and moveable between a folded position abutting said rear panel and an operative position at about a right angle to said rear panel and extending forwardly thereof; and,

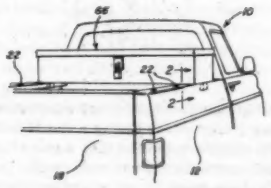
(b) a pair of slide guides releasably secureable to opposite sides of the tailgate of a vehicle, said guides each having a recess within which a side of said bed panel slides and is releasably secured.

4,531,774

TRUCK TOOL BOX ANCHOR ASSEMBLY

Gene Whatley, Rte. 2, Box 282, Hemphill, Tex. 75948

Filed Mar. 4, 1983, Ser. No. 472,116
Int. Cl.[3] B60R *9/00, 11/00;* B60P *7/10*
U.S. Cl. 296—37.6 3 Claims



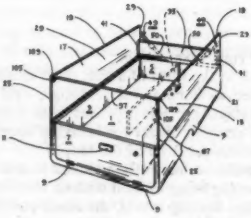
1. In combination with a pickup truck load bed including at least one upstanding wall portion defining a horizontal upper marginal edge and a stake socket opening upwardly through said upper marginal edge, a storage box including a bottom wall portion supported from said upper marginal edge, an anchor assembly removably anchored within said socket, said anchor assembly including a single one-piece horizontal base plate disposed within an upper portion of said socket, said base plate including opposite remote marginal portions, each of said marginal portions having the upper end portion of a corresponding depending arm pivotally supported therefrom for swinging movement of the lower end portions of said arms toward and away from each other, said arms closely opposing corresponding remote wall portions of said socket, upright elongated threaded fastener means threadingly secured through a central portion of said plate and including a lower end portion disposed between the lower end portions of said arms, abutment means rotatably mounted on the lower end portion of said fastener means, said abutment means and the adjacent sides of the lower end portions of said arms including coacting slidably engageable surfaces operative to wedge the lower end portions of said arms away from each other and into tight frictional engagement with said remote wall portions of said socket responsive to upward movement of said abutment means relative to said arms upon upward threading of said fastener means relative to said base plate, said bottom wall portion including an opening formed therethrough registered with said socket, the upper end of said fastener means projecting upwardly through said opening, said upper end of said fastener means including rotary torque receiving means spaced above said bottom wall portion adapting said fastener means to have a tool non-rotatably coupled to the upper end thereof for imparting rotary torque to said fastener means, and threaded abutment means threaded on the upper end portion of said fastener means below said rotary torque receiving means and above and bearing downwardly upon said bottom wall portion.

4,531,775

LOAD BEARING SECURITY COVER FOR PICK UP TRUCK

Tom C. Beals, 920 Fuchsia La., Carlsbad, Calif. 92008

Filed Mar. 12, 1984, Ser. No. 588,157
Int. Cl.[3] B60P *7/00*
U.S. Cl. 296—100 7 Claims



1. In a pick up truck comprising a flat bed, spaced-apart vertical side walls extending upward therefrom, a transverse upstanding front wall and rear tail gate, said tail gate adapted for lowering from a vertical position outward to a horizontal position, defining a cargo compartment, an openable load-bearing security cover therefor comprising:

(a) first and second rigid flat panels defined by inner and outer edges, forward and rearward edges and upper and lower surfaces, said outer edges pivotally attached along the top of the side walls to permit said panels to be swung from a vertical upward open position down toward each other to a closed position where said inner edges meet to form a continuous flat planar surface encompassing both said panels that rests on top of the walls and tail gate parallel to the bed to define a totally enclosed cargo compartment;

(b) a third stiff panel adapted for vertical positioning between the bed and said closed first and second panels with sides of the third panel in contact with the flat bed and the closed first and second panels to provide load bearing support thereto, said third panel movable to a transverse position between said first and second panels in their vertically open position to provide rigidity to the open panel configuration;

(c) first means connected between the front wall and each said first and second panel to assist in opening and closing said panels;

(d) second means including a lock in the tail gate to allow

locking and unlocking thereof for controllable access to the enclosed cargo compartment; and,

(e) third means for locking said panels into a closed, flat position on top of the walls and tail gate comprising:

(1) a lockable exposed handle mounted flush to said panel top surface in a depression formed therein;

(2) a turnable shaft connecting said handle through said panel to an arm adjacent said panel bottom surface; and,

(3) a pair of elongated rods extending from said arm in opposite directions along said bottom surface and parallel to said panel inner edge terminating at ends that extend through opposite apertures formed in the front wall and tail gate for locking and unlocking engagement therewith when said arm is rotated by said handle, said inner edges of said first and second panels adapted to engage in an interlocking manner such that locking of said first panel in the closed position prevents opening of said second panel.

4,531,776

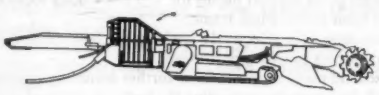
SAFETY CAB FOR UNDERGROUND MINING EQUIPMENT

Dee G. Laws, Price, Utah; Frank A. Scavo, Rte. #1, Box 157, Helper, Utah 84526; E. Wayne Laws, Price, and Frank R. Scavo, Helper, both of Utah, assignors to Frank A. Scavo, Helper, Utah, a part interest

Filed Dec. 27, 1983, Ser. No. 565,863

Int. Cl.³ B62D *33/06*

U.S. Cl. 296—190 **10 Claims**



1. Safety cab for underground continuous miner, comprising in combination:

a rectangular cab frame constructed of triangular cross-section tubing and enclosed in heavy metal mesh screen, and adopted for mounting on a continuous miner;

a cab canopy attached to the top of said frame constructed of triangular cross-section tubing and plate metal, said canopy having a plurality of surface planes;

a frontal view section disposed at the forward end of said cab frame and attached to said canopy, said frontal section being constructed of triangular cross-section tubing and heavy metal mesh screen;

a plurality of upright supports disposed at the corners of said cab frame constructed of triangular cross-section tubing extending from said canopy downwardly to rest on the continuous miner for support;

door means attached to said cab frame for entrance to said cab, said door means constructed of triangular cross section tubing and covered with heavy metal mesh screen, said door means constructed so as to support said cab frame when in the closed position; and

each of said triangular cross-section tubings having an outwardly exposed edge having the function of breaking up any falling material hindering full-surface contact with the cab.

4,531,777

MOTOR VEHICLE ROOF ARRANGEMENT OF THE TYPE INTERCHANGEABLY DRIVEABLE BY BOTH MOTOR AND CRANK DRIVES

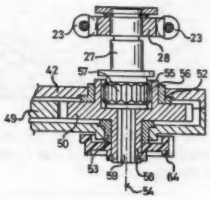
Horst Bienert, Gauting, and Alfons Lutz, Emmering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed May 17, 1983, Ser. No. 495,493

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224896

Int. Cl.³ B60J *7/00*

U.S. Cl. 296—223 **13 Claims**



1. In a motor vehicle roof arrangement of the type having a cover that is displaceable into and out of a position closing an opening in the roof through interchangeable use of one of both an electric motor and a crank drive, in conjunction with at least one incompressible driving cable and a pinion that engages in the driving cable and is arranged essentially on a center longitudinal axis of the motor vehicle roof in the vicinity of a front edge of the roof opening, the electric motor being flanged to a gear housing containing an intermediate drive so as to form a motor drive unit, the improvement for maximizing the number of parts used with both the electric motor and the crank drive, wherein the pinion is provided with a pinion shaft having gear elements at a portion thereof displaced from said pinion for interchangeably detachably engaging gear elements of a secondary drive wheel of the intermediate drive of the motor drive unit and correspondingly configured gear elements of the crank drive, said gear elements of the pinion shaft are formed by external serrations of a gear wheel at one end of the pinion shaft, the gear elements of the secondary drive wheel are internal serrations, and the hand crank has internal serrations corresponding to the internal serrations of the secondary drive wheel, wherein the internal serrations of the secondary drive wheel are formed within an annular projection that is supported within said gear housing at a side that faces toward the pinion, by way of a bearing bushing, and said secondary drive wheel is supported within said gear housing, at an opposite side that faces away from the pinion, by way of a second bearing bushing which receives a secondary drive shaft that projects from said opposite side.

4,531,778

RECLINER CHAIR INCORPORATING LINKAGE AND TRACK SYSTEMS

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

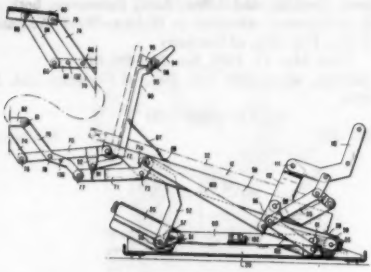
Filed Sep. 29, 1982, Ser. No. 426,707

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—85 **39 Claims**

1. A recliner chair comprising in combination, a base, track means fixed on the base, a seat, a trolley mounted in said track means, seat linkage means mounting the seat on the trolley for movement between a normal position, reclined TV position, and an advanced reclined position beyond the TV position, a footrest including a footrest linkage mounting the footrest to the seat for movement between a retracted position adjacent the seat and an extended position projected forwardly from the seat when the seat is in said TV position, means operatively connected between the footrest linkage and the seat linkage

means for moving said seat to said TV position by moving the footrest to the extended position while said trolley remains stationary in said track means, and means operatively connected between the seat and the base for moving said trolley along said track means to move said seat from said TV position into advanced reclining position.

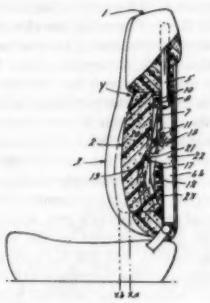


4,531,779

AUTOMOTIVE SEAT WITH LUMBAR SUPPORT

Yuji Hashimoto, Okayama, Japan, assignor to Namba Press Works Co., Ltd., Japan

Filed Jan. 24, 1983, Ser. No. 460,594
Int. Cl.³ A47C 7/46
U.S. Cl. 297—284 **21 Claims**



1. In a vehicle seat comprising a seat portion and a seat back portion, the improvement comprising:

an adjustable lumbar support assembly for reducing back fatigue of the seat occupant, said lumbar support assembly comprising

a support frame having upper and lower portions, the upper portion of said support frame being pivotally secured to said seat back portion for rotational movement about a generally horizontal fixed axis adjacent said upper portion;

lumbar engaging cushion carried on said support frame and having an upper portion generally flush with said seat back portion;

fulcrum means disposed on said seat back portion;

lever means pivotal about said fulcrum and coupled to said lower portion of said frame;

manually actuable means for effecting pivotal movement of said lever means thereby altering the angular relation of said cushion with respect to said seat back portion;

pin and slot means disposed on said seat back portion and on said lever means opposite said fulcrum for slidably securing said support frame to said seat back portion; and

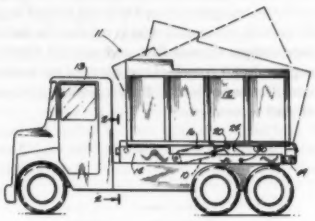
wherein said support frame is slidably secured by said pin and slot means to said seat back portion for translation with respect to said horizontal axis when said lever means is pivoted about said fulcrum, thereby allowing said cushion to shift upwardly and downwardly as the angular relation of said cushion is adjusted.

4,531,780

LIFT MECHANISM FOR A DUMP TRUCK

Bruce M. Boczkiewicz, Milwaukee, Wis., assignor to The Heil Company, Milwaukee, Wis.

Filed Sep. 3, 1982, Ser. No. 414,600
Int. Cl.³ B60P 1/32
U.S. Cl. 298—17.6 **6 Claims**



1. A lift mechanism for supporting and selectively tilting a truck dump body on a truck frame at pivot points located at the front and rear ends of the truck frame comprising:

a lift arm assembly means pivotally mounted in the truck frame and operatively connected to the dump body, said lift arm assembly adapted when actuated to exert a lifting force on the truck body;

a power cylinder pivotally connected at one end to the truck frame and at the other end to said lift arm assembly means, said power cylinder adapted when energized to cause said lift arm assembly means to pivot on the truck frame;

a first pivot support means for said body located at the rear of the truck frame;

a second pivot support means for said truck body located at the front of the truck frame;

a latch means for selectively latching the body to said first and second pivot support means;

said second pivot support means further including a support shaft for pivotally supporting the body on the front end of the truck frame, said support shaft adapted for horizontal sliding movement on the truck frame by means of a pair of horizontal guide rods to which the opposite ends of said support shaft are slidably attached, said second pivot support means further including a slide link means connected at one end to said support shaft and connected at the other end to said lift arm assembly means, said slide link means adapted to cause said support shaft to slide rearwardly on said guide rods when the body is tilted forwardly about the axis of said support shaft.

4,531,781

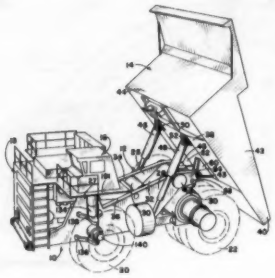
OFF-HIGHWAY DUMP TRUCK

Al E. Hunt; Richard A. Chandler, both of Cardin, and Robert J. Ward, Castle, all of Okla., assignors to Wiseda Ltd., Cardin, Okla.

Filed Mar. 14, 1983, Ser. No. 475,346
Int. Cl.³ B60P 1/16
U.S. Cl. 298—22 P **13 Claims**

1. A large off-highway two axle rear dump vehicle comprising a main frame section, a tilting dump body section, a cab section, a radiator section, front wheels independently secured to the main frame section to provide for steering of the vehicle, rear wheels secured to the opposite ends of a common axle to provide driving power for the vehicle, means conecting the main frame section to the axle whereby the rearmost end of the main frame section terminates short of the outer limit of the

axle, means supporting the radiator section whereby the vertical orientation of the radiator section may be adjusted, front suspension means operably connected with the front wheels for substantially isolating vertical movement of the front



wheels from the main frame section, and rear suspension means operably connected between the axle and the main frame section for substantially isolating the vertical movement of the rear wheels from the main frame section.

4,531,782

MINING EQUIPMENT

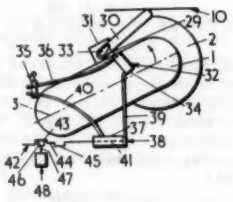
John A. Ford, and Raymond A. Whittaker, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Ltd., London, England

Filed May 13, 1983, Ser. No. 494,529

Claims priority, application United Kingdom, Jun. 11, 1982, 8217090

Int. Cl.³ E21C *27/20*

U.S. Cl. 299—1 **9 Claims**



1. Mining equipment for steering the cutting horizon of a mining machine cutter which is mounted on a ranging arm and which in use, makes repeated cutting traverses, comprises a boom movably mountable with respect to the ranging arm, hydraulic motor means for urging the boom towards a rock or mineral boundary to sense a cutting horizon made by the cutter on a previous traverse, and sensor means having an element movable in accordance with the operation of the hydraulic motor means and including control means for controlling the current cutting horizon made by the cutter in accordance with the sensed operation of the hydraulic motor means, said control means comprising a flow control valve having a plunger arranged to follow a working profile provided by the element.

4,531,783

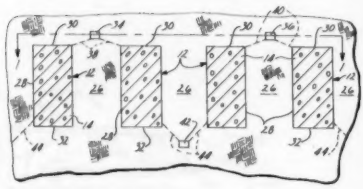
STABILITY CONTROL IN UNDERGROUND WORKINGS ADJACENT AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 314,674, Oct. 26, 1981, abandoned. This application May 29, 1984, Ser. No. 615,699

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—2 **19 Claims**



1. A method for recovering liquid and gaseous products from a non-subsiding system of in situ oil shale retorts formed in a subterranean formation containing oil shale, such as in situ oil shale retort having upper, lower, and side boundaries of unfragmented formation and containing a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:

forming spaced-apart rows of such in situ oil shale retorts in the subterranean formation containing oil shale, leaving a load-bearing inter-retort pillar of unfragmented formation between adjacent rows of such retorts, the inter-retort pillar being at least about the same order of thickness as the fragmented masses in adjacent rows of retorts on opposite sides of the inter-retort pillar such that the inter-retort pillar is sufficiently strong for supporting the weight of overburden at elevations above the adjacent rows of retorts without substantial subsidence of the overburden, the weight of the overburden being transferred to the load-bearing inter-retort pillar and thereby creating a stress zone in formation above the inter-retort pillar and the fragmented masses in the rows of retorts adjacent the pillar, a region of formation in the stress zone above the load-bearing inter-retort pillar being in compression;

excavating an air level drift in formation directly above the load-bearing inter-retort pillar of unfragmented formation, the roof of the air level drift being at an elevation spaced above the upper boundaries of retorts in such adjacent rows on opposite sides of the inter-retort pillar for placing the roof of the drift in the compression region of the stress zone for preventing tension in formation adjacent the roof;

providing fluid communication between the air level drift and an upper edge of such a retort in such a row;

establishing a combustion zone adjacent the upper edge of such a retort in such a row;

introducing an oxygen-supplying gas from the air level drift to the upper edge of such retort for advancing the combustion zone through the fragmented mass in the retort and establishing a retorting zone on the advancing side of the combustion zone for producing liquid and gaseous products of retorting; and

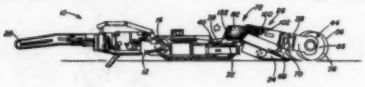
withdrawing the liquid and gaseous products from a lower portion of the fragmented mass.

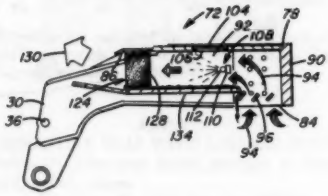
4,531,784

MINING MACHINE WITH DUST COLLECTOR APPARATUS

Jerry Karlovsky, Russell, Ky., assignor to National Mine Service Company, Pittsburgh, Pa.

Filed Mar. 17, 1983, Ser. No. 476,226
Int. Cl.³ E21C 35/22, 7/00
U.S. Cl. 299—64 10 Claims





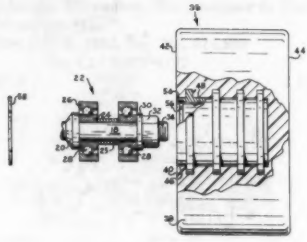
1. A mining machine comprising,
a mobile body portion,
a boom member pivotally secured to the body portion and extending forwardly therefrom,
a material dislodging device rotatably mounted on the front end of the boom member,
a conveyor extending rearwardly on the body portion,
said conveyor having a front end portion including means for gathering and receiving material dislodged by said material dislodging device and a discharge end portion for discharging dislodged material conveyed rearwardly on the body portion,
dust collecting means carried by said boom member in overlying relation with said conveyor front end portion for removing pollutants entrained in the air surrounding said material dislodging device,
said duct collecting means including a housing having an inlet for receiving pollutant laden air, an outlet for discharging air free of pollutants and a passageway connecting said inlet with said outlet,
spray means mounted in said housing at said inlet for directing a high pressure, liquid spray from said inlet to said outlet to induce an accelerated flow of the pollutant laden air through said passageway into mixture with the liquid spray,
filter means mounted in said housing at said outlet for separating a high velocity flow of air free of pollutants from a slurry including the liquid mixed with the pollutants removed from the air,
means associated with said filter means at said outlet for discharging said high velocity flow of air substantially free of pollutants in a first direction and said slurry in a second direction from said housing,
a second passageway in said housing above said first mentioned passageway,
said second passageway extending laterally relative to said first mentioned passageway,
a laterally positioned inlet connected by said second passageway to said outlet, and
said laterally positioned inlet including said spray means for inducing an accelerated flow of pollutant laden air into said housing in a direction laterally of said boom member.

4,531,785

ROLLER SKATE WHEEL AND MOUNTING ASSEMBLY

Kenneth R. Perkins, 42 Christy Rd., Gales Ferry, Conn. 06335

Filed Nov. 29, 1982, Ser. No. 445,254
Int. Cl.³ A63C 17/22
U.S. Cl. 301—5.7 23 Claims



4. A roller skate wheel for mounting on a skate axle subassembly of the type having a bearing unit securely mounted on the axle, comprising;
a hub portion;
a cylindrical tire portion about said hub portion with said tire and hub portions forming opposing first and second sides of the skate wheel, and
an annular insert mounted within said hub having,
a central cylindrical recess to snugly receive a bearing unit assembly, said recess having first and second ends with said first end opening out at said first side of the skate wheel,
an abutment shoulder at said second end of said recess adapted to abut the bearing unit to determine the axial position of said bearing unit within said recess, and
a plurality of radially extending ridges on the outer surface of said insert, and
said hub and tire portions being integrally formed about said annular insert between said ridges to firmly secure said tire and hub portions to said insert with said second side of said skate wheel being a continuous solid surface to prevent foreign matter from entering said recess.

4,531,786

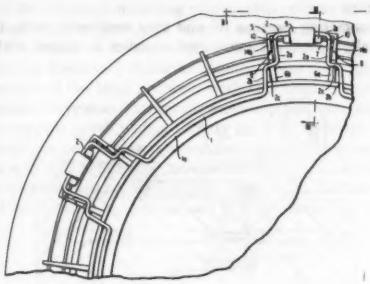
WHEEL COVER FOR WHEELS OF A PASSENGER MOTOR VEHICLE

Dieter Renz, Rechberghausen, and Bernd Löper, Korb, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 187,137, Sep. 15, 1980, abandoned. This application Mar. 1, 1983, Ser. No. 471,042
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937083
Int. Cl.³ B60B 7/00
U.S. Cl. 301—37 PB 20 Claims

1. A wheel cover for wheels of a passenger motor vehicle including a resilient wire ring means having a plurality of outwardly bent lug-shaped means distributed along a circumference thereof, which, for the purpose of mounting the wheel cover, are operable to engage in an annular recess of a wheel rim and are retained in the radial and axial directions in guide means, characterized in that the guide means include an inner radial abutment means in such a manner that the wire ring means is under a prestress in the unmounted condition of the wheel cover by engagement with the abutment means and in that cover means elastically connected to the wheel cover are coordinated to the guide means on the outer side thereof, said cover means extending over at least a portion of the radially outermost area of each lug-shaped means and being operable to

cause the lug-shaped means to disengage from the abutment means and thereby relieve the wheel cover from the prestress



of the wire ring means when the wheel cover is mounted on the wheel rim.

4,531,787

DEBRIS DEFLECTOR FOR ENDLESS TRACK SYSTEM

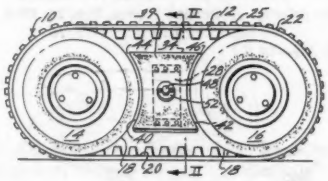
Cullen P. Hart, Peoria, and Wayne A. Klopfenstein, Laura, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01605, § 371 Date Dec. 2, 1980, § 102(e) Date Dec. 2, 1980, PCT Pub. No. WO82/01858, PCT Pub. Date Jun. 10, 1982

PCT Filed Dec. 2, 1980, Ser. No. 245,235

Int. Cl.³ B60S *1/62*

U.S. Cl. 305—12 **10 Claims**



1. In an endless track assembly (10) adapted for use on a vehicle (24), said endless track assembly (10) including a front pneumatic wheel (14) having a tread surface (18), a rear pneumatic wheel (16) having a tread surface (18), and an endless track (12) encircling said wheels (14,16), the improvement comprising a deflector (30) adapted for attachment to said vehicle (24), said deflector (30) having:

a front edge portion (40) adjacent the thread surface (18) of the front wheel (14);

a rear edge portion (42) adjacent the tread surface (18) of said rear wheel (16), one of said front and rear edge portions (40,42) being adapted for scraping accumulations of debris from the corresponding one of said wheel tread surfaces (18);

a deflection portion (32) defining an upper surface of said deflector (30), said deflection portion (32) being fashioned of an elastomeric material and being adapted to undergo flexure in response to at least one of scraping debris from one of said wheel tread surfaces (18) and movement of said vehicle (24);

an inboard portion (36);

an outboard portion (38); and,

an intermediate portion (39), said intermediate portion (39) being elevated above one of the inboard portion (36) and the outboard portion (38).

4,531,788

LINEAR SLIDE BEARING

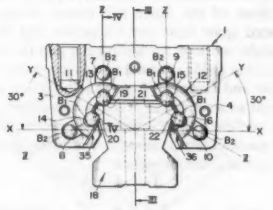
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,113

Claims priority, application Japan, May 10, 1983, 58-80024; May 13, 1983, 58-83827

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **13 Claims**



1. A linear slide bearing comprising:

an integral main body with a channel-like cross-section constituted by left and right skirt portions and a central cavity formed between said skirt portions, said main body having a pair of race receiving grooves formed in the opposing surfaces of said skirt portions confronting said central cavity and non-loaded ball grooves disposed near both ends of respective race-receiving grooves and communicating with said race-receiving grooves;

a pair of bearing races constituted by arcuate members having a semi-circular cross-section, each of said bearing races being provided in its inner surface with a pair of loaded ball grooves;

a track shaft received in said central cavity of said main body and provided at its both shoulder portions with ribs extending along the length thereof, said track shaft being provided at the upper and lower sides of each rib with loaded ball grooves corresponding to said loaded ball grooves in the adjacent bearing race;

a pair of end covers adapted to be attached to both longitudinal ends of said main body so as to straddle said track shaft, each of said end cover being provided in its inner surface with ball turning grooves for connecting said loaded ball grooves in said bearing races and in said track shaft to corresponding non-loaded ball grooves in said main body, and race retaining grooves for retaining adjacent ends of said bearing races; and

balls adapted to be recirculated through endless ball passages constituted by loaded ball passages formed by said loaded ball grooves in said bearing races and said track shaft, non-loaded ball passages presented by said non-loaded ball grooves in said main body and said ball turning grooves formed in respective end covers.

4,531,789

ROTATABLE STOCK CONTAINER CLOSET

Takusuke Iemura; Takeshi Goto, and Hiroshi Komaki, all of Yokohama, Japan, assignors to Okamura Corp., Japan

Division of Ser. No. 203,449, Nov. 3, 1980, Pat. No. 4,379,602.

This application Apr. 11, 1983, Ser. No. 483,481

Claims priority, application Japan, Nov. 3, 1980, 55-30585

The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.

Int. Cl.³ A47B *49/00*; B65G *17/16*

U.S. Cl. 312—268 **4 Claims**

1. A rotatable stock container closet including a plurality of container conveying units arranged vertically one above the other, each container conveying unit comprising:

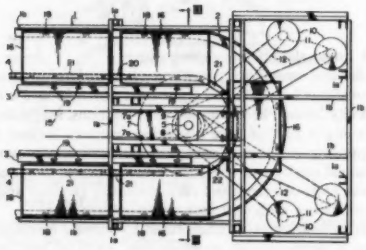
(a) an endless loop outer rail means extending in a horizontal plane; the outer rail means generally having an elliptic

shape and comprising a pair of straight sections extending parallel with each other and a pair of curvilinear sections, with the curvilinear sections being connected to the straight sections for completing the elliptic shape;

(b) inner rail means comprising a pair of straight sections each extending in the horizontal plane and each having a respective end disposed toward and inward from the curve of at least one of the curvilinear sections of the outer rail means; each straight section being inside a respective straight section of the outer rail means at a set distance away therefrom; the respective end of each of the straight sections of the inner rail means being adjacent to and spaced apart from the respective end of the other of the straight sections for defining a gap therebetween;

(c) discrete guide channel means extending in the horizontal plane and arranged between the inner and the outer rail means at a set distance away therefrom;

(d) an endless loop traction chain means which is guided by the guide channel means and is adapted to be moved along the guide channel means;



(e) means for driving the traction chain means; the driving means comprising two sprockets supported spaced apart and each being located generally at and inside the curve of a respective one of the cuvilinear sections of the outer rail means; at least one of the sprockets also being located near the gap between the two adjacent ends of the pair of straight sections of the inner rail means disposed toward the respective curvilinear section; the sprockets receiving the traction chain means therearound; and the sprockets also being shaped and placed so that they define a continuation of the channel means at the sprockets; disposed

(f) a plurality of container means releasably disposed to the traction chain means through respective support means, the container means connected to ride along the rail means, whereby the container means are moved on and along the inner and the outer rail means and are moved together with the traction chain means;

(g) at the curvilinear sections of the outer rail means, the container means riding across the gap between the adjacent ends of the straight sections of the inner rail means along the respective sprocket and along the curvilinear section of the outer rail means.

4,531,790

ELECTRICAL CONNECTOR GROUNDING RING

Gerald J. Selvin, Huntington Beach, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,757

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 R **4 Claims**

1. An electrical connector member comprising:

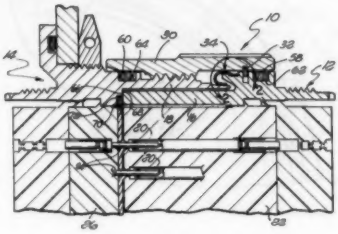
a first shell surrounding an insulator adapted to contain electrical contacts, said shell having a forward end;

a peripherally continuous, single-layer annular ring mounted on said shell;

the wall of said ring, in longitudinal section, having a generally C-shaped configuration with opposite ends and a middle, and with the convex surface thereof facing forwardly of said shell;

said ring embodying a radially resilient free-end contacting portion;

said contacting portion of said ring resiliently deflecting radially when the connector member is mated with a



second connector member having a second shell which telescopically engages with said contacting portion;

said C-shaped ring surrounding said forward end of said first shell so one end of said C-shaped configuration lies on the radially outer side of said shell and the other end of said C-shaped configuration lies on the radially inner side of said shell.

4,531,791

FEED-THROUGH FOR HYBRID CIRCUIT BOX AND MATCHING CONNECTORS

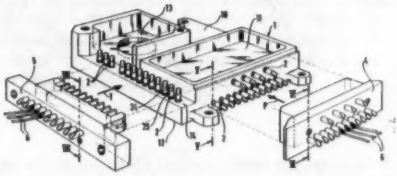
Bernard Bauchet, La Frette, France, assignor to Sintra-Alcatel, Asnieres, France

Filed Feb. 23, 1983, Ser. No. 469,062

Claims priority, application France, Feb. 24, 1982, 82 03035

Int. Cl.³ H01R *23/12, 11/16*

U.S. Cl. 339—14 R **7 Claims**



1. In combination, a complementary assembly, a hybrid circuit box, said hybrid circuit box having a box wall, a row of feed-throughs projecting through said box wall, glass beads borne by said box wall, each feed-through being in the form of a generally cylindrical pin extending through the thickness of the box wall with first and second ends projecting respectively inside the box and outside the box, said pins being mounted within said box wall by said glass beads such that said pins are sealed by said glass beads and insulated thereby from said box wall, and wherein said through-hole pins have a coefficient of expansion compatible to that of the glass beads, said first end of each cylindrical pin functioning as a connection to a hybrid circuit internally of said box, the second end of each feed-through cylindrical pin being terminated by a generally cylindrical head portion of greater outside diameter than the rest of the pin, said head portion being fixed at a distance from the wall of the box and being provided with an axial bore open at the end of the feed-through and suitable both for receiving a contact of an external connector and for receiving a conductor lead to be soldered thereto, depending on the requirements of a user, said complementary connector comprising a plurality of cylindrical conductive contacts in the form of longitudinally

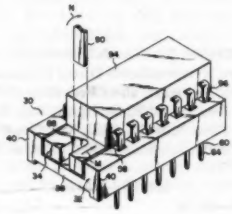
split pins, each of said split pins having a first end portion of suitable length and a diameter to be received axially in the bore of a corresponding feed-through head portion, being held in fixed feed-through matching relationship relative to the other split pins by a support, said support having a first plane surface at a level close to the tips of the split pins and having split-pin receiving bores of a diameter slightly larger than the outside diameter of the head portions, with said head portions being received therein, and means for mounting said split pins within said support bores with a slightly loose fit in order to leave enough play to compensate for dimensional inaccuracy when said split-pins are insertably received within the axial bores of the feed-through cylindrical pins so as to prevent fracture of said beads mounting pins to said hybrid circuit box wall.

4,531,792

IC CONNECTOR

Akiyoshi Oshitani, and Akira Katsumata, both of Tokyo, Japan, assignors to Kel Corporation, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,205
Claims priority, application Japan, Jan. 29, 1982, 57-13105
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—17 CF **13 Claims**



1. An IC connector for connecting lead terminals extending from an IC package of the in-line type to terminals of a circuit board, comprising:

a slide body which is made of an insulating material and which has an array of first grooves and first projections in at least one surface thereof;

a main body which is made of an insulating material and which has a plurality of second grooves on a surface thereof opposing said one surface of said slide body, said plurality of second grooves being formed along said first grooves and first projections;

connecting terminals, which are made of an electrical conductive material and have an elastic structure, one end of each being mounted in one of said second grooves, and the other end of each being adapted to be connected to a predetermined terminal of the circuit board; and

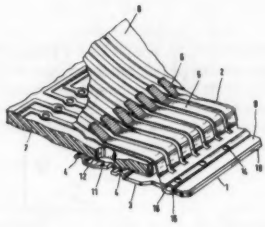
supporting means for supporting said slide body to be movable, along said second grooves, to a first position and a second position; when said slide body is located in said first position, said first and second grooves oppose each other and form a gap between each of said first grooves and a corresponding one of said second grooves so as to receive one of said lead terminals therein, and when said slide body is located in said second position, said first projections oppose said second grooves and said first projections urge said connecting terminals against said second grooves and urge said connecting terminals against said lead terminals when said lead terminals are inserted in said second grooves.

4,531,793

MULTIPOLE EDGE STRIP CONNECTOR

Gerhard Hochgesang, Bad Neustadt, Fed. Rep. of Germany, assignor to Preh Elektrofeinmechanische Werke Jakob Preh Nach. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,652
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245521
Int. Cl.³ H01R *23/66*
U.S. Cl. 339—17 F **18 Claims**



1. Multipole edge connector apparatus for the electrical connection of contact surfaces of a flexible flat ribbon cable with the congruent edge contact surfaces having the same modular dimensions of a printed circuit board, comprising:

clamplike holder means for holding said cable contact surfaces and said printed circuit board contact surfaces in predetermined connection,

said holder having first and second members whereby the holder can be attached to an edge of said printed circuit board, said first and second members having respective holding strip portions and being attached at said portion, said first and second members having respective different thicknesses and having profiles which provide an asymmetric clamping contour,

said first member having a smaller thickness that said second member and comprising flexible tongues corresponding to each of the congruent contact surfaces, each of said tongues having an end part contoured to apply pressure against said cable and circuit board contact surfaces,

said second member having a supporting part of greater thickness than said first member and having embossed means for defining a pressure portion thereof which absorbs pressure from said tongue end parts, and

wherein said holding strip portions each have opposing longitudinal grooves, and comprising weld fixing means integrally joining said holding strip portions on both sides of said grooves.

4,531,794

ELECTRICAL OUTLET SAFETY FIXTURE

Karen H. Heverly, 894 Village Cir., Blue Bell, Pa. 19422

Filed Jan. 27, 1984, Ser. No. 574,380
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—39 **6 Claims**

1. An electrical wall outlet protective fixture which is detachably mountable to an existing electrical plug receptacle comprising:

(a) a rectangular back wall member configured to substantially overlie the plug receptacle;

(b) a retention pin adapted to affix said back wall member to said receptacle;

(c) four essentially flat walls extending outwardly from the periphery of said back wall member providing two opposing side walls, a top wall, extending outwardly from said back wall member a distance greater than said side walls and a bottom wall extending outwardly from said back wall member a distance greater than said side walls;

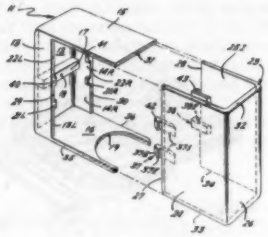
(d) an open portion provided in said bottom wall and of a

sufficient size to permit the passage of at least one electrical plug power cord;

(e) at least one opening in said back wall member adapted to provide access to the receptacle sockets;

(f) at least one pair of studs affixed one each on each inside face of said side walls at a location across from one another and protruding towards one another;

(g) a separate cover member having two essentially flat sides spaced apart and held apart by a third front side sized so that the cover flat sides will abut in close proximity to the



outwardly extending vertical edges of said side walls extending from said back wall member, and

(h) at least one pair of latching elements affixed diametrically across on the edge of the inside face of each of said flat sides of the cover member and extending partially beyond thereof, said latching elements being adapted to fit and detachably lock with said paired studs, when the said cover member is slipped into cooperative union with said four flat walls extending outwardly from said back wall member.

4,531,795

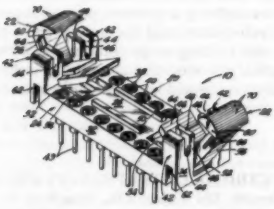
EJECTOR SOCKET FOR DIP JUMPERS

William Y. Sinclair, Stockton, N.J., assignor to Aries Electronics, Inc., Frenchtown, N.J.

Filed Mar. 1, 1983, Ser. No. 471,025

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **7 Claims**



1. An ejector socket for a DIP jumper comprising:

a generally rectangular socket member including opposed top and bottom surfaces and socket apertures extending therebetween, opposed generally planar front and rear surfaces extending between said top and bottom surfaces, and opposed first and second ends, said socket member further including first and second pairs of spaced apart arms extending upwardly from said top surface, said first and second pairs of arms being disposed respectively adjacent the first and second ends of said socket member, one arm in each said pair of arms being adjacent the front surface of said socket member and the other arm in each said pair being adjacent the rear surface thereof, said socket member further including first and second pairs of spaced apart resilient fingers disposed intermediate the arms of said first and second pairs of arms respectively, each said resilient finger being generally parallel to and spaced from at least a portion of the arms in the respective first and second pairs of arms such that the resilient fingers in each said pair can be biasingly urged away from one another and toward one said arm in the respective first and second pairs of arms, each said resilient finger including a locking groove on the side thereof nearest the other resilient finger in its respective pair; and

first and second latches, each said latch including an elongated locking member and ejecting and retaining members extending generally perpendicularly from opposed ends of said locking member, said locking member including a pair of bosses dimensioned and located to be received in said locking grooves, said latches being pivotably mounted with respect to said first and second pairs of resilient fingers such that each said latch may be rotated between first and second positions, such that in said first position said locking member is disposed intermediate its respective pair of locking arms, and the locking bosses thereof are frictionally and lockingly engaged by said locking grooves and with the ejecting member of said latch being substantially parallel to said top surface of said socket member, and such that in said second position said ejecting member extends angularly from said top surface, whereby the arms of said ejector socket protect the DIP jumper mounted therein from inadvertent contact and whereby the resilient fingers biasingly move to engage the respective latches for lockingly holding the DIP jumper in the ejector socket.

4,531,796

ELECTRICAL PLUG-AND-SOCKET CONNECTOR

Willi Gansert, Kornwestheim; Dieter Hussmann, Steinheim, and Gert Jakob, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,257

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218677

Int. Cl.³ H01R *11/00*

U.S. Cl. 339—60 M **9 Claims**

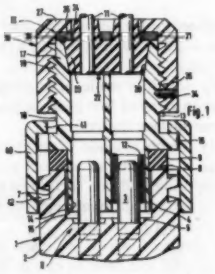


Fig. 1

1. Weatherproof, dirtproof and shakeproof electrical connector assembly comprising a rigid cup-shaped first connector body (1) of insulating material having a cup-bottom portion in which prong connector elements (3) are set which have forward extremities and a hollow cylindrical portion (4) which has an exterior, has an annular extremity (8) and encircles a space into which said prong elements extend, and a second rigid connector body (10) having a front portion for facing said first connector body and a rear portion for leading out wires and having socket connector elements (12) affixed to ends of wires (11) inserted through said rear portion of said connector body, a socket-confining casing plug (13) having exterior and interior surfaces, a compressible seal plug (22) for said wires, through which said wires pass, a stiff pressure washer (25) and a capnut (27, 31) provided with an interior surface having

screw threads, through which capnut said wires pass, said capnut being mounted for pressing said washer, seal plug, casing plug and second connector body into a rigid block and thereby sealing said wires pressure tight in said casing plug, said assembly further comprising:

a rim-like extension (17) of said casing plug (13) extending to an annular rear extremity thereof and having an external surface and a frustoconical internal surface (20) for seating said seal plug (22), said seal plug having a complementary frustoconical external surface therefor, said pressure washer (25) fitting against an annular shoulder (26) of said seal plug for forcing said seal plug into said rim-like extension (17) of said casing plug (13) and also being stoppable by the rear extremity of said rim-like extension of said casing plug (13), said capnut (27, 31) being tightenable on the exterior surface of said casing plug (13) by rotary motion for pressing said pressure washer (25) against said seal plug (22);

a flange (16) on said casing plug (13), having a front surface facing the extremity (8) of said cylindrical portion (4) of said first connector body (1) and having a rear surface, and a forward extension (15) of said casing plug, extending forward beyond said flange and beyond the forward extremities of said socket elements (12), fitting loosely within said cylindrical portion (4) of said first connector body (1), having cavities (14) which laterally surround said respective socket elements (12) at an annular gap spacing therefrom and having an external surface;

a seal ring 9 having its full axial dimension interposed between said casing plug flange (16) and the extremity (8) of said cylindrical portion (4) of said first connector body (1) for compression therebetween, said seal ring (9) fitting also about the external surface of said casing plug forward extension (15) for limiting inward expansion of said seal ring, and

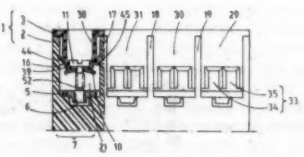
sleeve-like securing means (40, 43) tightenable on the exterior of said cylindrical portion (4) of said first connector body (1) by rotary motion and having inturned grasping means (41, 44) reaching around said flange (16) of said casing plug (13) for securing together said first (1) and second (10) connector bodies while compressing said seal ring (9).

4,531,797

ELECTRICAL CONNECTION DEVICE WITH READY-ACCESS PROTECTED TERMINALS

Claude Jullien, Thenezay, and Gérard Lerude, Poitiers, both of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Feb. 14, 1983, Ser. No. 466,199
Claims priority, application France, Feb. 12, 1982, 82 02354
Int. Cl.³ H01R *11/00, 9/00*
U.S. Cl. 339—61 M **8 Claims**



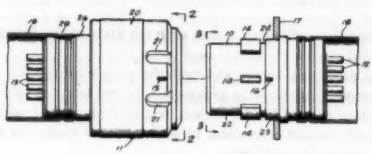
1. An electrical connection device including a body with plural neighboring housings separated by at least one of partitions and walls parallel to the screwing axes of a number of connection terminals, each of which has an internal fixed conductor with a threaded opening and a set-screw equipped with a clamp that always remains under the head of a bolt; and a protective cover that hooks onto the body and opposite each bolt head has a coaxial cylindrical opening that is able to guide a screwing tool and that maintains the bolt in a pending position where a threaded tip is placed opposite the threaded opening, characterized in that the interior diameter of the cylindrical opening is greater than the diameter of the head of the bolt, the cylindrical opening being surrounded by a thin wall transversely distorted by an exterior surface of the wall working together with a rib carried by a said partition or wall so that the bolt head can be inserted in the cylindrical opening using gravity when the cover is not coupled to a body and can be gripped by the distorted wall when the cover is coupled to the body.

4,531,798

HEAVY-DUTY ELECTRICAL CONNECTOR

Robert Baur, Los Angeles; Ralph T. Iversen, Granada Hills, and Roger C. Stephenson, Woodland Hills, all of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Mar. 29, 1982, Ser. No. 363,253
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—75 M **7 Claims**



1. An electrical connector having plug and receptacle parts which are selectively joinable by rotation of a coupling ring, comprising:

the coupling ring has a threaded bore which directly and continuously engages a complementary set of threads on an outer surface of the plug, and a flange which lockingly engages the receptacle during joining the connector parts;

means carried by and rotating with the coupling ring which contact further means carried by the plug preventing relative rotation of the coupling ring and plug beyond predetermined maxima; and

a layer of resilient insulative material carried by one of the connector parts which is compressed during joining of the connector parts, said layer having a predetermined thickness insuring layer compression throughout the full range of connector part manufacturing tolerances.

4,531,799

ELECTRICAL CONNECTOR

George G. Gray, Mattapoisett, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 336,759, Jan. 4, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 586,653
Int. Cl.³ H01R *13/631*
U.S. Cl. 339—75 M **10 Claims**

1. Apparatus for making electrical contact to a connector means comprising:

a connector means;

a substantially planar holder means;

a mounting frame;

a circuit board having at one end said connector means which has a plurality of first pins in a fixed position parallel to the plane of said holder means and to each other;

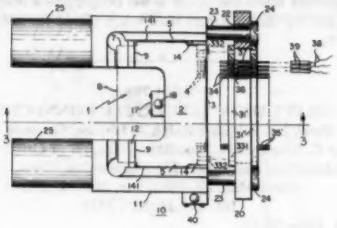
said holder means having said circuit board secured thereto;

a slide connected to said frame, said slide having a plurality of electrically conducting second pins mounted in said slide, said second pins in electrical isolation from each other and parallel to the plane of said holder means;

each of said second pins having a resilient mounting means to allow resilient second pin movement in the longitudinal direction of said second pins;

said connector means being secured to said circuit board so that the first pins of said connector means are laterally and longitudinally aligned with the second pins of said slide when said holder means is in said frame;

means for moving said slide relative to said connector means in a direction so that the ends of the second pins of said slide make pressure contact in the longitudinal direction of



said first and second pins with the ends of the first pins of said connector means; and

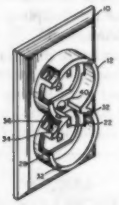
said mounting frame and said slide preventing said holder means from moving longitudinally and transversely to the plane of said holder means, respectively, while said pressure contact is applied, to maintain said holder in a fixed position in said frame.

4,531,800

PROTECTOR DEVICE FOR ELECTRICAL OUTLETS

Marshall S. Avener, 113 E. Linn St., Bellefonte, Pa. 16823

Filed Oct. 31, 1983, Ser. No. 547,073
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—75 P **6 Claims**



1. An interchangeable protective device adapted for installation upon an electrical outlet, plug and cord connected thereto, comprising in combination:

a receptacle plate having an electrical outlet thereon;

a raised collar on said receptacle plate encircling said electrical outlet, said raised collar having:

a tab slot extending longitudinally inward through said raised collar;

a locking slot extending approximately perpendicular to said tab slot in a circumferential direction through the inner portion of said raised collar;

a tab indentation extending from said locking slot to the outer surface of said raised collar;

a split cap positioned about an electrical plug and cord, said split cap adapted for insertion within said raised collar;

a flexible locking tab adapted for inward motion extending from the outer surface of said split cap, adapted to engage said tab slot and said locking slot, and to protrude through said tab indentation, said locking tab adapted to being unlocked when pressed inwardly;

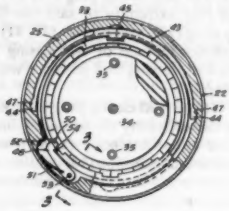
a flat surface positioned on said locking tab adapted to bear against said locking slot in a locking relationship.

4,531,801

PLUG AND RECEPTACLE CONNECTOR LOCKING MEANS

Robert Baur, Los Angeles, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Feb. 8, 1984, Ser. No. 577,974
Int. Cl.³ H01R *13/623*
U.S. Cl. 339—89 M **5 Claims**



1. A releasable locking means for an electrical connector having a receptacle shell receivable within a plug shell and a coupling ring shell and rotatable to drive the plug and receptacle shell toward or away from each other depending on the direction of rotation, comprising:

a pawl mounted on an inner surface of the coupling ring shell;

spring means resiliently urging the pawl into contact with plug shell;

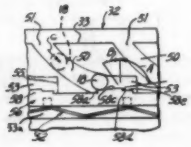
said plug shell including an opening in a plug shell wall through which a part of the pawl is urged by the spring means when the coupling ring shell is threaded on the plug shell to the point of release of the receptacle shell to lock the coupling ring shell against relative movement with respect to the plug shell, and said receptacle shell on being received within the plug shell engages the pawl part extending through the plug shell opening and moves said pawl part to a position enabling relative movement between said plug and coupling ring shells.

4,531,802

ELECTRICAL CONNECTOR ASSEMBLY HAVING LOCKING MEANS

Vladimir Tomsa, Chicago, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Apr. 27, 1984, Ser. No. 604,792
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—90 R **11 Claims**



1. An electrical connector assembly comprising first and second connector members, a coupling member rotatably mounted to said first connector member for connecting to the second connector member to cause a portion of said first connector member to abut a portion of said second connector member, one and the other said second connector member and said coupling member including, respectively, a radially ex-

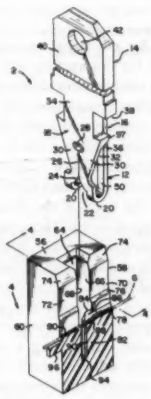
tending bayonet pin and a wall provided with a helical groove arranged to be threadably engaged by the pin for pulling the connector members together into mated relation upon rotation of the coupling member in one direction, said helical groove having an entrance port for receiving the pin and spiralling axially rearward from the port to its terminus, and locking means for locking the mated assembly together by restraining said coupling member against unwanted rotation in the other direction, said locking means being characterized by a cylindrical lock ring disposed in a plane perpendicular to the axis of rotation and in a clearance fit about said first connector member for axially sliding movement thereto, said lock ring having a top and a bottom surface and a shoulder, said shoulder being normally free from engagement with said bayonet pin and extending longitudinally forward from the top surface and into the terminus for captivating said bayonet pin when the pin is advanced thereto; locator means for constantly locating the shoulder adjacent to the terminus; and bias means acting against the bottom surface for biasing the lock ring axially towards said helical groove.

4,531,803

ELECTRICAL TERMINAL AND TERMINAL HOUSING FOR MAKING CONNECTIONS TO INSULATED WIRES

Donald W. K. Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1982, Ser. No. 410,237
Int. Cl.³ H01R *4/02*
U.S. Cl. 339—97 R **9 Claims**



1. An electrical terminal housing for forming an electrical connection to at least one wire, the terminal being of the type comprising first and second plate-like members in side-by-side relationship which are joined at corresponding ends by an integral bight, a wire-receiving slot extending into the bight and partially along the length of the terminal, the housing having a terminal-receiving end and having first and second external sidewalls extending from the terminal-receiving end, a terminal-receiving cavity extending inwardly from the terminal-receiving end, the cavity having opposed first and second cavity sidewalls which are proximate to the first and second external sidewalls respectively, first and second wire-admitting slots extending inwardly from the terminal-receiving end, the slots having closed inner ends, the first wire-admitting slot intersecting the first external sidewall and the first cavity sidewall, the second wire-admitting slot intersecting the second external sidewall and the second cavity sidewall, and a wire supporting surface of in the cavity for supporting a wire positioned in the wire-admitting slots with a portion of the wire extending through the cavity, the terminal and housing being characterized in that:

a rib is provided in the cavity which rib is spaced from the second cavity sidewall and integral with and extending from the first cavity sidewall, one end of the rib being adjacent to the inner end of the first wire admitting slot, the wire supporting surface being on the one end of the rib, the rib extending further into the cavity from the one end and having a side surface portion which is spaced from and extends alongside, the second cavity sidewall,

the wire-receiving slot is formed as a sheared slit provided in the second plate-like member, the bight and the first plate-like member having an elongate clearance opening therein which is dimensioned to receive the rib, the clearance opening extending longitudinally of the first plate-like member in alignment with the sheared slit in the second plate-like member, the distance between the side surface portion of the rib and the second cavity sidewall being sufficient to slidably receive the second plate-like member,

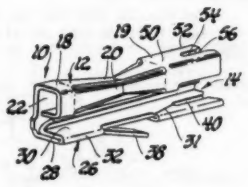
whereby, upon placement of the wire in the wire-admitting slots and insertion of the terminal into the cavity, the rib is received in the bight and the clearance opening with the wire supporting surface aligned with the sheared slit and a portion of the wire which extends from the wire supporting surface to the second cavity sidewall will be received in the sheared slit and the wire will thereby be connected to the terminal.

4,531,804

INSULATION SHEARING ELECTRICAL TERMINAL

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 26, 1983, Ser. No. 498,402
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—97 R **2 Claims**



1. An insulating shearing electrical terminal for terminating an insulated conductor comprising;

a web having a flange integrally joined thereto at a longitudinal edge,

said flange being folded over onto itself to form outer and inner elongated plates which are integrally joined to each other at one end by a longitudinal bight which is laterally spaced from the web,

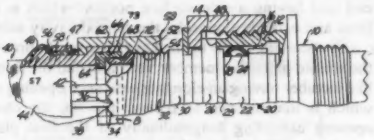
said outer plate having a longitudinal slot at the opposite end of the flange for receiving an insulated conductor with its axis transverse to the longitudinal slot, and

said inner plate having an inner longitudinal side slidably engaging the web and an outer longitudinal side at the opposite end which overlaps the longitudinal slot in the outer plate for biasing the insulated conductor against the longitudinal side of the longitudinal slot of the outer plate which is remote from the web.

4,531,805
ELECTRICAL CONNECTOR ASSEMBLY HAVING MEANS FOR EMI SHIELDING

Dee A. Werth, Bainbridge, N.Y., assignor to Allied Corporation, Morristown, N.J.

Filed Apr. 3, 1984, Ser. No. 596,347
Int. Cl.³ H01R *13/658, 17/12*
U.S. Cl. 339—143 R 23 Claims

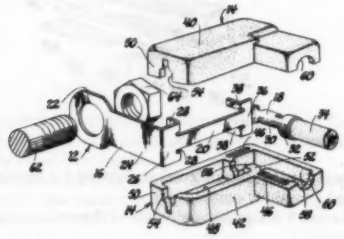


1. An electrical connector assembly comprising a shell of electrically conductive material including a generally cylindrical back shell having a transverse end face, a cable having a center conductor encircled by a conductive braid received within and extending outwardly from said back shell, means including an accessory boot of an electrically conductive material for connecting the cable to the back shell, and means for shielding the center conductor against electro-magnetic interference, characterized by said means for shielding providing a continuous 360° electrically conductive seal between the conductive braid and said back shell and comprising a ferrule of electrically conductive material in electrical circuit relation to the cable braid and a sleeve of electrically conductive material in electrical circuit relation to said braid and said ferrule and having a frusto-conical annular wall portion thereof overlapping and completely encircling the back shell, the diameter of said annular wall portion having a dimension sized to interference fit relative to the back shell at a location spaced longitudinally inward from its transverse end face whereby said annular wall portion completes a continuous electrical seal and circuit path around and between the back shell.

4,531,806
FUSIBLE ELECTRICAL CONNECTOR

Shao-Chung Hsieh, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1983, Ser. No. 555,051
Int. Cl.³ H01R *3/00*; H01H *85/04*
U.S. Cl. 339—147 R 7 Claims

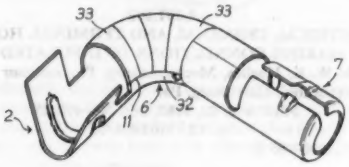


1. A fusible electrical connector assembly comprising
a sheet metal terminal of one-piece construction having a contact end portion, a cable attachment end portion and an intermediate fuse portion which is the sole terminal portion connecting the contact end portion to the cable attachment end portion, and
a housing having a fuse chamber in which the intermediate fuse portion of the terminal is disposed,
said chamber in part being defined by first and second spaced walls of the housing, each of which has a slot opening extending therethrough,
said contact end portion of the terminal extending into the chamber through the slot opening in said first wall and having conformations on the opposite sides of said first wall,
said cable attachment portion extending into said chamber through the opening in said second wall and having conformations on the opposite sides of said second wall, and
said conformations of the end portions of the terminal cooperating with the respective spaced walls to retain the respective end portions of the terminal in assembly with the housing upon failure of the intermediate fuse portion due to an excessive electric current.

4,531,807
BENT TERMINAL FOR ELECTRICAL CONNECTION

Jean Trigon, Dagneux, France, assignor to L'Electricfil Industrie, France

Filed Jun. 9, 1982, Ser. No. 386,642
Claims priority, application France, Jun. 11, 1981, 81 11885
Int. Cl.³ H01R *15/12*
U.S. Cl. 339—223 S 6 Claims

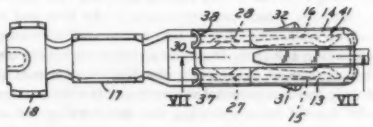


1. A bent terminal for electrical connection comprising an arm for crimping and for connecting electrically with a conductor, a substantially tubular arm elastically deformable radially for connecting with a complementary terminal and a bent portion of fixed shape joining said arms, the bent portion comprising a curved segment defining an envelope of generally toric form, the envelope having a cross-section substantially equal to that of the tubular arm; said envelope having a radius of curvature, taken at the level of the inner generatrix for the toric form, of the order of one to three times the diameter of the tubular arm; the envelope further being a continuation of the tubular arm; said curved segment including a first half-shell affixed to the arms and having curved inner and outer edges formed about a common center point, with the inner edge being interposed between the outer edge and the center point; said curved segment also comprising a plurality of tongues extending from the outer edge of the half-shell, the tongues being rolled and bent towards the center of the envelope and contacting the inner edge of the half-shell.

4,531,808
BLADE COUPLING TERMINAL

Thomas M. Cairns, Birmingham; John H. Dewar, Grosse Ile, and Emmons F. Sumner, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 16, 1983, Ser. No. 495,233
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—258 S 1 Claim



1. A contact blade coupling means for contacting an electri-

cal connector having a generally planar configuration, said coupling means including a terminal comprising:

a first pair of generally planar, elongated side members including a first inside member and a first outside member and joined to one another at least along a portion of a first common edge and having first spacing means to limit bending about said first common edge toward one another so that said first pair of side members are substantially parallel to each other;

a second pair of generally planar elongated side members including a second inside member and a second outside member joined to one another at least along a portion of a second common edge and having second spacing means to limit bending toward one another so that said second pair of side members are substantially parallel to each other, and so that said first and second pairs of elongated side members are parallel to each other;

said first inside and second inside members being spring contacts and positioned in prestressed contact against one another and movable about parallel axes so that there is an increased contact force for holding an intermediate electrical blade connector;

a bracer means extending between said first and second inside members, and connected integrally to one of said first and second inside members, so as to provide a barrier to maintain the spacing between said first and second inside members even in the presence of a compressing force; and

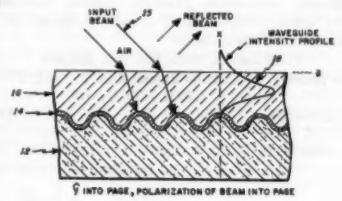
said bracer means being a tab extending generally perpendicular out from one end of said first inside member, said tab being on one side of said spacing means and said coupling means further comprising a first contact spring surface on the other side of said spacing means on said first inside member.

4,531,809

OPTICAL WAVEGUIDE COUPLING DEVICE

Gary M. Carter, Lexington; Yung-Jui Chen, Weston, and Sukant K. Tripathy, Arlington, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 8, 1983, Ser. No. 530,287
Int. Cl.³ G02B 5/18
U.S. Cl. 350—96.19 **20 Claims**



1. An optical waveguide coupling device comprising

a base substrate having formed therein an optical grating, said base substrate comprising silicon,

a thin metal film deposited on the optical grating, and

a polymer film deposited over the thin metal film,

whereby substantially all incident power may be coupled into the waveguide mode, and

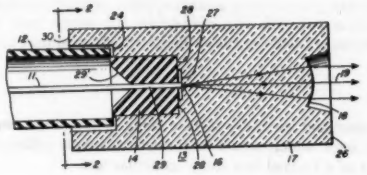
wherein said optical grating is formed by etching the silicon substrate with a predetermined grating period and amplitude.

4,531,810

OPTICAL FIBER HOLDERS

W. John Carlsen, Boston, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 440,139, Nov. 8, 1982, Pat. No. 4,442,383, which is a continuation of Ser. No. 112,991, Jan. 17, 1980, abandoned. This application Oct. 11, 1983, Ser. No. 540,473
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **1 Claim**



1. A precision molded elastomeric optical fiber holder, for holding an optical fiber of a first diameter, said fiber holder comprising a molded cylindrical piece of elastic material having an axial hole of a second diameter from one end of said piece to another end thereof, said hole being tapered to a third diameter near one only of said ends, and

wherein said third diameter is greater than each of said first diameter and said second diameter, and

wherein prior to insertion of said fiber, said second diameter is smaller than said first diameter.

4,531,811

FIBER OPTICS POLARIZER

John W. Hicks, Jr., Sturbridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 223,599, Jan. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 21,868, Mar. 19, 1979, Pat. No. 4,315,666. This application Jun. 14, 1983, Ser. No. 504,232
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 **12 Claims**

1. A single mode fiber optics polarizer for use in a system, said polarizer comprising a first core, a second core and a cladding, said second core being of a construction to provide differing propagation constants for two polarization states, said first core porpagating a desired polarization and of characteristics to provide lateral coupling of undesired polarization for a predetermined length with said second core.

4,531,812

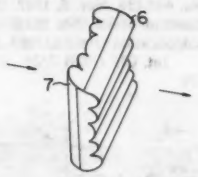
REAR PROJECTION SCREEN

Masanori Oguino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 473,862
Claims priority, application Japan, Mar. 10, 1982, 57-36379
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 **10 Claims**

1. A rear projection screen comprising at least one combined Fresnel and lenticular lens surface which exhibits both Fresnel lens action for macro-converging divergent input light rays and lenticular lens action for micro-diverging said input light rays, said combined Fresnel and lenticular surface including a

number of narrow stripes extending in horizontal or vertical direction and forming a recess at each interconnection of stripes with the angle formed at the recess in said combined



Fresnel and lenticular surface being enlarged as compared to the angle which would be formed by simple addition of profiles of a Fresnel lens and a lenticular lens.

4,531,813

OVERHEAD VIEWING MIRROR APPARATUS FOR BEDRIDDEN AND PARALYZED PERSONS

Christiaan Van den Berg, Nijmegen, Netherlands, assignor to Wopex V.O.F., Nijmegen, Netherlands

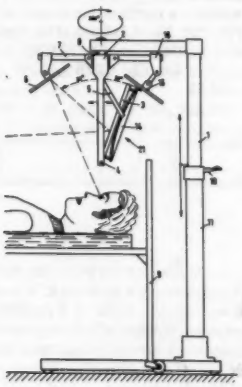
PCT No. PCT/EP82/00107, § 371 Date Jan. 18, 1983, § 102(e) Date Jan. 18, 1983, PCT Pub. No. WO82/03982, PCT Pub. Date Nov. 25, 1982

PCT Filed May 19, 1982, Ser. No. 463,441

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119844

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—623 **8 Claims**



1. An overhead viewing mirror apparatus for bedridden and paralyzed persons, comprising:

a vertically adjustable mount to which a mirror assembly is attached, wherein the mirror assembly includes

a center mirror which has a mirror surface on either side thereof and which is adapted to be pivoted from the vertical starting position over an angle of up to 30° to either side about an axis or shaft, and

a lateral mirror mounted on each side of the center mirror in a position angularly inclined relative to the latter; and

wherein the mirror assembly is rotatable about a vertical axis or shaft.

4,531,814

METHOD AND APPARATUS FOR TEMPORARILY INCREASING THE ABSORPTANCE OF OPTICAL TRANSMITTING COMPONENTS

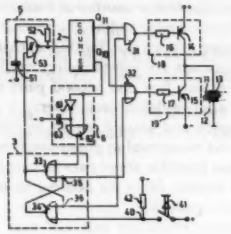
Horst Ballmer, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 435,062

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142908

Int. Cl.³ G02F *1/01*; G02C *7/10*

U.S. Cl. 350—355 **15 Claims**



1. Apparatus for charge control of an electrochromic layer, said layer being uncolored for the condition of no charge in said layer and said layer being in a predetermined colored state for a predetermined charge in said layer, said apparatus comprising: said layer; and control means for changing from one to the other of said states; said control means including first limited-current means connected to charge said layer and second limited-current means connected to discharge said layer, actuating means including a flip-flop circuit for initiating a change from one to the other of said colored and uncolored states, timing means connected (a) to initiate a predetermined timed interval in response to said actuating means and (b) to return said flip-flop circuit to said one state thereof upon completion of the timed interval, and gating means connected to said flip-flop circuit and operative (a), in the uncolored state of said layer, to operate said first limited-current means for charging said layer during said interval upon operation of said actuating means and (b), in the colored state of said layer, to operate said second limited-current means for discharging said layer during said interval upon operation of said actuating means.

4,531,815

OBJECTIVE LENS

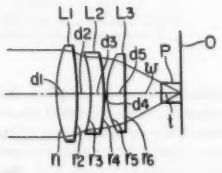
Kunio Konno, Yokohama; Masashi Tanaka, Kawasaki, and Hiroshi Ohki, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,808

Claims priority, application Japan, Jun. 9, 1982, 57-98685

Int. Cl.³ G02B *9/14, 21/02*

U.S. Cl. 350—475 **13 Claims**



1. A compact objective lens having a long working distance, comprising a positive first lens disposed at a position most distant from an object surface, a meniscus-shaped second lens

disposed on the object side of said first lens and having its convex surface facing the object side, and a positive third lens disposed on the object side of said second lens, said objective lens satisfying the following conditions:

$$0.9<|r_4|/f<25$$

$$-0.45<f/f_2<0.02$$

$$d_4/f<0.18$$

$$0.50f<\Sigma d<1.0f$$

where f is the total focal length of the entire system, r_4 is the radius of curvature of the surface of said second lens which is adjacent to the object side, f_2 is the focal length of said second lens, d_4 is the spacing between said second lens and said third lens, and Σd is the full length from said first lens to said third lens.

4,531,816

SPACING SAFETY MECHANISM FOR OPERATION MICROSCOPES WITH ELECTROMOTIVE STANDS

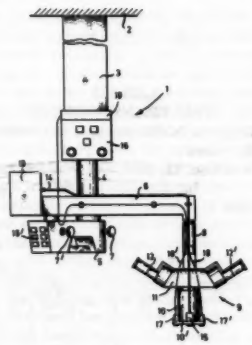
Patrice Baumgärtel, Roquevaire, France, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,309

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 8302999[U]

Int. Cl.³ G02B *21/00*; G05B *9/02*

U.S. Cl. 350—521 **9 Claims**



1. A spacing safety mechanism for an operation microscope mounted on an electromotive stand with a motor drive for changing the position of said microscope, said safety mechanism comprising an ultrasonic transmitter (17) mounted on the microscope and an ultrasonic receiver (17') also mounted on the microscope, and an electronic unit (19), arranged on said stand and cooperating with said motor drive, for producing a signal for said ultrasonic transmitter and processing signals from said ultrasonic receiver.

4,531,817

FOCUS ADJUSTING DEVICE IN BINOCULAR

Akira Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 5, 1983, Ser. No. 539,290

Claims priority, application Japan, Oct. 12, 1982, 57-154255[U]

Int. Cl.³ G02B *7/06*

U.S. Cl. 350—556 **6 Claims**

1. A binocular comprising:

(a) a pair of telescopes, each of the telescopes comprising a body portion and optical member which is movable relative to the body portion in the direction of the optical axis for focus adjusting operation;

(b) means for connecting said telescopes, the connecting means being provided between the body portions and comprising a first tubular member fixed to at least one of said body portions;

(c) a rod member provided coaxially with said first tubular member and movable integral with said optical members;

(d) a second tubular member provided concentrically with said first tubular member and said rod member, said second tubular member being rotatable and movable axially;

(e) first cam means for connecting said first and second tubular members, the first cam means moving the second tubular member itself in the axial direction thereof in response to the rotation of the second tubular member;

(f) second cam means for connecting said rod member and said second tubular member, the second cam means moving the rod member in the axial direction thereof in response to the rotation of and axial movement of said second tubular member; and

(g) means for operating said second tubular member, the operating means comprising an operation member concentric with said first tubular member and integrally connected to said second tubular member in the rotating direction thereof, the operation member being provided with an operation portion to be touched by an operator.

4,531,818

ADAPTER FOR ARRANGING AN INSTANT PICTURE CASSETTE AT A 35 MM CAMERA AND METHOD FOR MANUFACTURING THE SAME

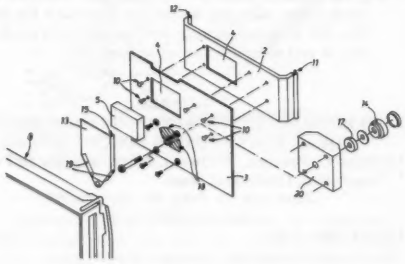
Diego Bally, Zurich, Switzerland, assignor to Markus Grass, Italy

Filed Jun. 1, 1983, Ser. No. 499,830

Claims priority, application Switzerland, Jun. 8, 1982, 3530/82

Int. Cl.³ G03B *17/52, 17/56*

U.S. Cl. 354—83 **9 Claims**



1. An improved adapted for mounting an instant picture cassette to a camera, wherein the back wall of the camera is

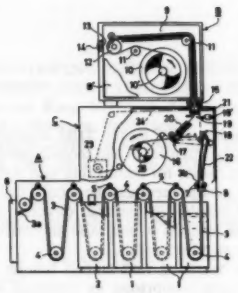
removable, the adapter comprising an adapter plate which is fixedly mounted to the instant picture cassette; a back member corresponding to the removable back wall of the camera carried on the adapter plate, the adapter plate and the back member each having an opening therein and the openings together contain a fiber optic face plate for transferring an image formed at an image plane of the camera to the plane of the film in the instant picture cassette, a resilient support for the face plate within the adapter plate and the back member for causing the face plate to bear against the focal plane defining guide members of the camera in the assembled state.

4,531,819

DEVICE FOR STORING EXPOSED FILM FOR PHOTOGRAPHING AND DEVELOPING APPARATUS

Tsutomu Katsuyama, Yokohama, Japan, assignor to Bell & Howell Japan Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 584,149
Claims priority, application Japan, Mar. 1, 1983, 58-31753
Int. Cl.³ G03B *17/50*
U.S. Cl. 354—92 **11 Claims**



1. A device for storing exposed film for a photographing and developing apparatus, which is provided between a developing unit and a photographing unit and includes a storage reel for taking up an exposed portion of film fed out from a film roll for photographing and a cutter for cutting the exposed portion of the film fed from the photographing unit, comprising:

a first pinch roller pair disposed in the neighborhood of the storage reel in a reversibly rotatable state;

a second pinch roller pair disposed in a reversibly rotatable state at a position spaced apart from the storage reel and cutter;

a feed roller pair capable of only forward rotation disposed above the cutter and adapted to feed the exposed film from the photographing unit to the storage reel; and

a guide member disposed between said first and second pinch roller pairs and adapted to introduce the exposed film fed from said storage reel via said first pinch roller pair to said second pinch roller pair.

4,531,820

ELECTROMAGNETIC ACTUATOR GENERATING EQUAL AND OPPOSING FORCE VECTORS

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 22, 1983, Ser. No. 506,787
Int. Cl.³ G03B *9/40*
U.S. Cl. 354—234.1 **10 Claims**

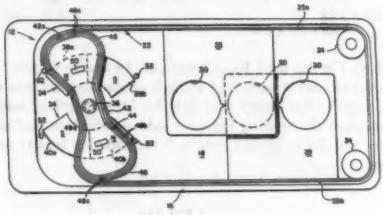
1. An electromagnetic actuator comprising:

an armature assembly;

means for rotatably supporting said assembly for movement about a given axis;

conducting means operatively associated with one of said armature or said supporting means and being electrically energizable;

a permanent magnetic arrangement operatively associated with the other of said assembly or supporting means and being arranged adjacent to said conducting means, said arrangement establishes at least a permanent magnetic field offset from said axis and which encompasses at least a portion of said conducting means such that when the



latter is energized with a given current polarity said assembly is driven in one direction about said axis; and,

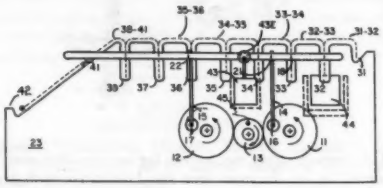
said arrangement, said conducting means and said assembly being constructed and arranged with respect to each other such that when said conducting means is energized generally opposing portions of said assembly develop force vectors which are generally equal in magnitude and opposite in direction generally throughout rotation of said assembly.

4,531,821

ITEM-TRANSPORTING

Eric Mears, Rockport, Mass., assignor to Cordell Engineering, Inc., Peabody, Mass.

Filed Dec. 12, 1983, Ser. No. 560,128
Int. Cl.³ G03D *3/08*
U.S. Cl. 354—320 **12 Claims**



1. Transporting apparatus comprising,

first and second driven rotating members,

first and second crank means pivotally connected to said first and second driven rotating members, respectively, at pivot points near the periphery of each for converting rotary motion into rectilinear motion,

moving guide bar means connected to said first and second crank means respectively for imparting both vertical and horizontal motion,

and stationary guide means for engaging carrier means for supporting an item to be transported and coacting with said moving guide bar means for restricting translation of said carrier means when supported by said guide bar means,

said carrier means being slidably supportable on said moving guide bar means and slidable in said stationary guide means for supporting items to be transported along a path having a cycloidal component.

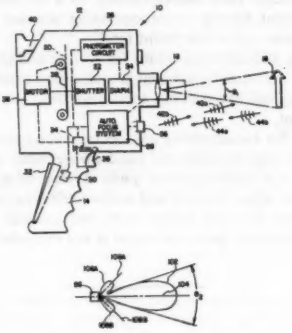
4,531,822
EXTENDED SONIC ACCEPTANCE ANGLE

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 965,404, Dec. 1, 1978, abandoned. This application Jun. 11, 1980, Ser. No. 158,472

Int. Cl.³ G03B *19/18, 3/00*

U.S. Cl. 354—401 **5 Claims**



1. An autofocusing motion picture camera comprising:

means for selectively coupling said camera to a source of energy;

an image plane;

a lens assembly including an adjustable focus lens mounted for displacement over a given operational range where it serves to focus images at said image plane of subjects positioned within a range of subject distances and including optical angle varying means for varying the optical field of view of said lens assembly between a wide angle position and a telephoto position, said lens assembly having an optical field of view angle equal to θ_1 when the optical angle of said lens assembly is varied to its said telephoto position;

means including a transducer having an acceptance angle equal to θ_2 for periodically sensing the range of a subject encompassed by said acceptance angle and for producing a signal indicative of said range, said transducer acceptance angle θ_2 encompassing said optical field of view angle θ_1 when said adjustable focus lens is positioned to its telephoto position where its optical field of view angle equals θ_1; and

means responsive to said range signal for optimally displacing said adjustable focus lens to the focal position corresponding to the range of said sensed subject in anticipation of said subject entering the space encompassed by said telephoto optical field of view angle θ_1 as soon as said subject enters the space encompassed by transducer acceptance angle θ_2.

4,531,823
ELECTROSTATIC COPYING MACHINE HAVING REMOVABLE PAPER PATH

Yutaka Deguchi, Himeji; Rikuzou Kouzuki, Kasai; Daiwa Iinuma, Kasai; Kenhachi Shiraki, Kasai; Kiyoshi Sakamoto, Kanzaki; Kunio Tsuboi, Kasai, and Yoshitaka Shibata, Taka, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

PCT No. PCT/JP82/00089, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO82/03702, PCT Pub. Date Oct. 28, 1982

PCT Filed Mar. 31, 1982, Ser. No. 447,194

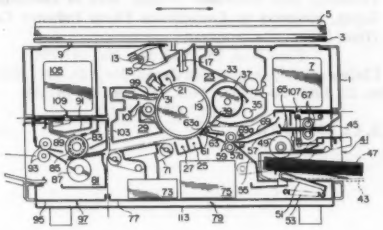
Claims priority, application Japan, Apr. 17, 1981, 56-58818; Apr. 17, 1981, 56-58819; May 19, 1981, 56-72822; May 19, 1981, 56-72823; May 19, 1981, 56-075964; Aug. 20, 1981, 56-123906; Sep. 1, 1981, 56-130629; Sep. 4, 1981, 56-132446

Int. Cl.³ G03G *15/00, 15/22;* **B65H** *31/22, 5/02*

U.S. Cl. 355—3 R **23 Claims**

1. An electrostatic copying machine for copying images onto copy paper comprising a machine body having an exterior and having first and second opposite exterior sides, copy paper supplying means for supplying said copy paper, a photosensitive drum on which an electrostatic image is formed, a supply of toner, developing means for developing said electrostatic image into a toner image formed from said toner, means for transferring said toner image onto said copy paper, fixing means for fixing said toner image which has been transferred onto said copy paper to provide a fixed image thereon, and means for ejecting from said machine body second exterior side, said copy paper having said fixed image, wherein:

a copy paper transporting path is defined between said copy paper supplying means and said ejecting means in a first direction therebetween;



first and second machine body assemblies;

a first portion of said copy paper transporting path being disposed on said first assembly and a second portion of said copy paper transporting path being disposed on said second assembly;

said copying machine further comprising means for movably supporting said first and second assemblies, said first and second assemblies being movable in a direction substantially parallel to said first direction and away from each other to said machine body exterior.

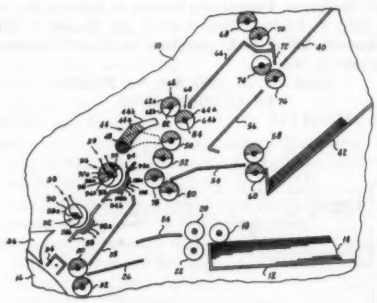
4,531,824
HEATER FOR ELECTROPHOTOGRAPHIC COPIERS

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Filed Jul. 14, 1983, Ser. No. 513,726

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **6 Claims**



1. An electrophotographic copier including in combination means for transferring to one side of a carrier sheet a visible toned image, means for transporting the sheet along a path, said transporting means comprising a plurality of narrow drive elements widely spaced transversely of the path and contacting a portion of said side of the sheet, first means extending transversely of the path for uniformly heating the entire sheet, and

second means for preferentially heating a corresponding plurality of narrow strips of the sheet spaced transversely of and extending along the path, each strip being aligned with a corresponding drive element, said first and second heating means being disposed at respective first and second positions spaced long the path.

4,531,825

ELECTROSTATIC REPRODUCING APPARATUS HAVING AN INTERMEDIATE TONER IMAGE TRANSFER MEMBER

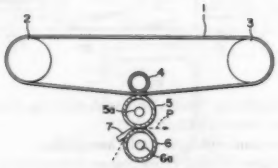
Tadashi Miwa, Kunitachi; Kiyoshi Kimura, Iruma; Yukio Okamoto, and Noriyoshi Tarumi, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Hino, Japan

Filed Nov. 15, 1982, Ser. No. 441,794

Claims priority, application Japan, Nov. 25, 1981, 56-187856; Nov. 25, 1981, 56-187857; Nov. 25, 1981, 56-187858

Int. Cl.³ G03G *15/16*

U.S. Cl. 355—3 TR **9 Claims**



1. In an electrostatic reproducing apparatus wherein a toner image formed on a toner image retaining member is transferred onto an intermediate transfer member and the toner image on said intermediate transfer member is transferred to and fixed on a transfer material, the improvement comprising the aforesaid toner image retaining member being formed in a belt, and further comprising a transfer pressure roller for pressing the back surface of the belt such that its front toner image retaining surface contacts said intermediate transfer member, wherein the surface of said transfer pressure roller is covered with an elastic body which is deformable in the pressing contact of the belt against said intermediate transfer member, the latter being relatively nondeformable and having a low heat capacity.

4,531,826

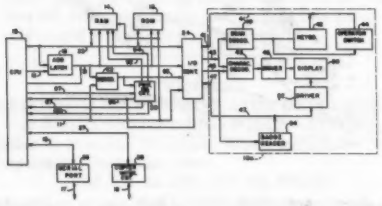
EVENT COUNTER AND ACCESS CONTROLLER

Alan M. Stoughton, Vincentown; Charles C. Hansen, Sr., Marlton; John P. Leahy, Mount Laurel, and Robert F. Millar, Lindenwold, all of N.J., assignors to Danyl Corporation, Moorestown, N.J.

Filed Apr. 30, 1982, Ser. No. 373,675

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 CU **10 Claims**



1. In an event counter and access controller system having an internal central processing unit, memory storage unit, a subsystem including an operator's display and keyboard, a device for outputting an event pulse having a leading edge and a trailing edge, and pulse certification means for producing a valid enable pulse in response to said edges; means for setting up the system in a set-up mode prior to a normal mode of operation by the an operator comprising:

first selecting means for selecting a machine access code having at least a one-digit code for a first verification of the access of the operator,

second selecting means for selecting in said memory storage unit an individual identification of each of a plurality of accounts each corresponding to a different user, each account having a corresponding account identification number and event count total,

sorting and selecting means for sorting and selecting one of said accounts by account identification number and examining said event count total associated with said one account,

means for incrementing and decrementing said event count total responsive to said valid enable pulse, and

means for enabling event pulse device during the normal mode when the first and second selecting means verify a proper machine access code and account identification number and the event count is not exceeded.

4,531,827

METHOD AND APPARATUS FOR IMPROVED RETENTION COPYING

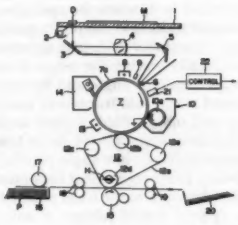
Noriyoshi Tarumi, Hachioji; Kiyoshi Kimura, Iruma, and Haruo Iwahashi, Fussa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Hino, Japan

Continuation of Ser. No. 308,610, Oct. 5, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 528,995

Claims priority, application Japan, Oct. 16, 1980, 55-143645

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**



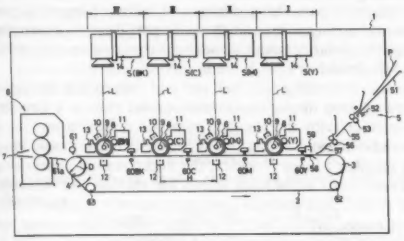
1. In a method for producing multiple copies of an original in a retention-type reproducing apparatus which includes a charge receptor, comprising the steps of: forming an electrostatic latent image of the original and an electrostatic latent image of a reference patch on said charge receptor, developing said latent images to corresponding toner images thereof; transferring said toner images of said original onto a transferring member; cleaning a surface of said charge receptor of developer remaining thereon; the improvement which comprises the steps of: detecting the surface potential of the electrostatic latent image of said patch, comparing said surface potential a reference value, and providing one of the following steps as a next step for a further copying: (a) developing the existing latent image on said charge receptor without forming a new latent image if said detected surface potential of said electrostatic latent image of said patch is more than said reference value; and (b) reforming the electrostatic latent images of said original and said patch on the charge receptor after eliminating the existing latent image in case that said detected potential of said electrostatic latent image of said patch is less than the reference value.

4,531,828

IMAGE RECEIVING MEMBER CONVEYING DEVICE OF A MULTIPLEX IMAGE FORMING APPARATUS

Osamu Hoshino, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,557
Claims priority, application Japan, Mar. 31, 1983, 58-56213
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **10 Claims**



1. An image receiving member conveying device for a multiplex image forming apparatus in which a plurality of images are superposed on an image receiving member and made into a final image, said device comprising:

rotative driving means for moving the image receiving member by rotation;

a plurality of image processing stations disposed along the direction of movement of said image receiving member at which stations images can be formed on the image receiving member passing therethrough; and

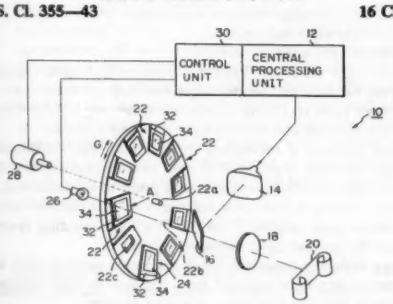
means for conveying the image receiving member through said image processing stations, the distance between adjacent ones of said image processing stations being integer times the amount by which the image receiving member is conveyed by one full rotation of said rotative driving means.

4,531,829

MULTI-FORM SLIDE SELECTION APPARATUS

Noboru Arai; Masaji Yokota, and Takekazu Yanagimoto, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1983, Ser. No. 526,813
Claims priority, application Japan, Sep. 6, 1982, 57-154876
Int. Cl.³ G03B *27/52, 27/70*
U.S. Cl. 355—43 **16 Claims**



1. A multi-form slide positioning apparatus for a multi-form slide recording system in which a specific one of a plurality of form slides individually received in form-slide housing sections of form-slide carrying means is selected and information recorded on the specific slide is projected from a projecting position by optics onto a recording medium, said positioning apparatus comprising:

form slide mount means for individually mounting the form slides, said form slide mount means being individually removably received in the housing sections of the form slide carrying means;

mount drive means for driving the form slide mount means, which has said selected form slide thereon, to move toward the projection position from the housing section associated therewith; and

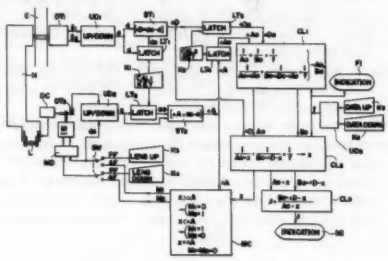
mount means positioning means for blocking the movement of the mount means to position said mount means at said projection position.

4,531,830

AUTOMATIC FOCUSING DEVICE FOR AN ENLARGER

Yoshio Yuasa, Osaka; Nobukazu Kawagoe, Sakai, and Hidetoshi Yasumoto, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 14, 1983, Ser. No. 532,719
Claims priority, application Japan, Sep. 16, 1982, 57-161755
Int. Cl.³ G03B *27/34, 27/40*
U.S. Cl. 355—56 **8 Claims**



6. An improved enlarger for producing prints from an image bearing negative comprising:

a light source;

a film carrier;

an enlarging lens;

means for supporting the light source, film carrier and enlarging lens in operative positions for different print magnifications;

means for producing a focal length signal representative of the focal length of the enlarging lens;

first means for focusing the enlarging lens to a first magnification position and producing and retaining first signals representative of that position;

second means for focusing the enlarging lens to a second magnification position and producing and retaining second signals representative of that position;

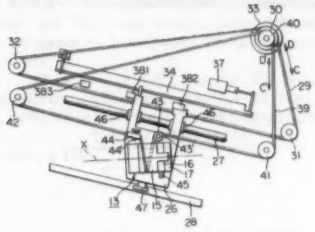
means for moving the film carrier to a final magnification position and producing a signal representative of the amount of movement of the film carrier, and

means for automatically adjusting the position of the enlarging lens to the final focus position from the focal length signal, first signals, second signals and movement signal.

4,531,831
VARIABLE MAGNIFICATION IMAGE FORMATION APPARATUS

Tadayuki Kitajima, and Akiyoshi Kimura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,013, Oct. 27, 1982, abandoned.
This application Jul. 5, 1984, Ser. No. 628,023
Claims priority, application Japan, Nov. 11, 1981, 56-181558; Nov. 11, 1981, 56-168471[U]
Int. Cl.³ G03B *27/34*
U.S. Cl. 355—57 **26 Claims**

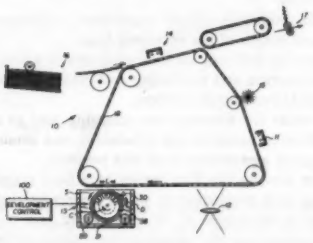


1. A variable magnification image formation apparatus including:
means for supporting an original;
a photosensitive member;
a zoom lens assembly disposed in an optical path between said means for supporting an original and said photosensitive member for forming an image of the original on said photosensitive member, said zoom lens assembly having a rotational member rotatable about the optical axis of the lens to change the focal length of the zoom lens, and the length of said optical path being constant irrespective of selected magnification;
zoom lens assembly moving means for moving said zoom lens assembly along a predetermined path to change the magnification of the image of the original;
a wire member wound onto said rotational member; and
wire member moving means for moving said wire member at the movement speed of said zoom lens assembly multiplied by a predetermined constant different from 1 in synchronism with the operation of said zoom lens assembly moving means to rotate said rotational member.

4,531,832
ELECTROGRAPHIC APPARATUS, METHOD AND SYSTEM EMPLOYING IMAGE DEVELOPMENT ADJUSTMENT

Arthur S. Kroll, and Frank A. Shuster, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,476
Int. Cl.³ G03G *15/09*
U.S. Cl. 355—3 DD **9 Claims**

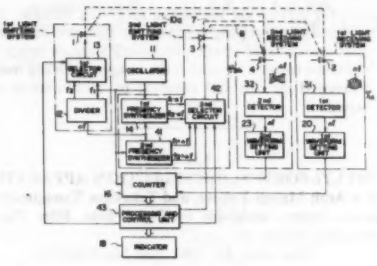


1. In electrographic apparatus of the type wherein an imaging member bearing an electrostatic image pattern to be developed is moved at a predetermined linear velocity through a development zone whereat developer is applied and which has a development system including:
(a) a supply of dry developer mixture including electrically insulative toner marking particles and hard magnetic carrier particles, both of average particle size less than about 100μ;
(b) a non-magnetic cylindrical shell that is rotatable on an axis for transporting said developer mixture between said supply and said development zone;
(c) a magnetic core that includes a plurality of magnetic pole portions arranged around the core periphery in alternating magnetic polarity relation and is rotatable on an axis within said shell; and
(d) means for rotating said shell and said core so that developer is transported through said development zone in a direction co-current with the imaging member direction and at an operative linear velocity that is generally equal to said imaging member's linear velocity, the improvement comprising:
(e) development adjustment means for varying the rotational rate of said shell and said core cooperatively to adjust developed image density and/or contrast while maintaining said operative developer velocity and direction.

4,531,833
OPTICAL RANGE FINDER

Fumio Ohtomo, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,533
Claims priority, application Japan, Aug. 31, 1981, 56-136594
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—5 **6 Claims**



1. An optical range finder comprising:
a first light emitting system;
a second light emitting system;
a first light receiving system for receiving light radiated from the first and second light emitting systems;
a second light receiving system for receiving light radiated from the first and second light emitting systems;
means defining a measuring optical path for introducing light radiated from the first light emitting system into the first light receiving system via a point to be measured;
means defining a first inner reference optical path for introducing light radiated from the first light emitting system into the second light receiving system;
means defining a second inner reference optical path for introducing light radiated from the second light emitting system into the first light receiving system;
means defining a third inner reference optical path for introducing light radiated from the second light emitting system into the second light receiving system;
control means for controlling the first and second light emitting systems in a manner which includes a first and second step, the first step including the second light emitting system radiating light having a modulation frequency of either $(f-\Delta f)$ or $(f+\Delta f)$ at the same time as the first

light emitting system radiates light having a modulation frequency (f), and the second step including the second light emitting system radiating light having a modulation frequency (Δf) when the first light emitting system is not radiating light, wherein the modulation frequency (Δf) is significantly lower than the modulation frequency (f);

phase difference detecting means for determining a first phase difference between the first and second light receiving systems when the first step is carried out, and a second phase difference between the first and second light receiving systems when the second step is carried out; and

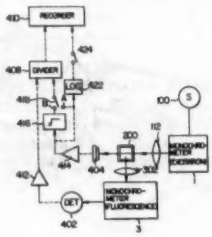
processing means for eliminating a phase delay resulting from the electrical elements of the optical range finder by subtracting the second phase difference from the first phase difference.

4,531,834

FLUORIMETER

Taro Nogami, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,248
Claims priority, application Japan, Apr. 7, 1982, 57-56550
Int. Cl.³ G01N *21/64*
U.S. Cl. 356—73 **3 Claims**



1. A fluorimeter comprising:

an excitation optical system projecting excitation light with a wavelength selected for a sample into said sample;

a sample cell accommodating said sample;

fluorescence sensing means sensing the fluorescent light emitted by said sample;

transmission light sensing means sensing the light transmitted through said sample;

arithmetic division means dividing the output of said fluorescence sensing means by the output of said transmission light sensing means and providing a signal representing the intensity of the fluorescent light so that the variation of the intensity of said excitation light is corrected; and

a square root calculator provided between said transmission light sensing means and said division means, and adapted to calculate the square root of the output signal from said transmission light sensing means, said division means dividing arithmetically the output of said fluorescence sensing means by the output of said square root calculating means.

4,531,835

METHOD FOR DETECTING F-NUMBER OF LENS

Kenichi Oinoue, Tokyo, Japan, assignor to Olympus Optical Company Limited, Japan

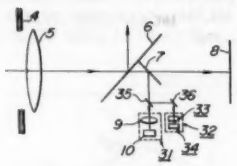
Filed Jun. 14, 1983, Ser. No. 504,063
Claims priority, application Japan, Jun. 15, 1982, 57-102403
Int. Cl.³ G03B *13/22*
U.S. Cl. 356—124 **14 Claims**

7. A method for detecting a focus condition of an imaging lens comprising the steps of

projecting two images on a first light receiving element array by means of an auxiliary optical system, said two images being formed by light fluxes transmitted through different areas of the imaging lens;

detecting a defocus amount of the imaging lens by detecting a lateral shift of said two images;

projecting an image of an exit pupil of the imaging lens on a second light receiving element array by means of an exit pupil focusing lens;



detecting a magnitude of said image of the exit pupil of the imaging lens formed on the second light receiving element array;

deriving an effective F-number of said imaging lens in accordance with the detected magnitude of the image of the exit pupil of the imaging lens; and

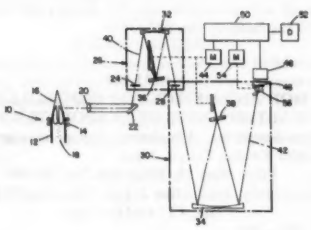
correcting said defocus amount of the imaging lens in accordance with the effective F-number of the imaging lens to derive a corrected defocus amount.

4,531,836

METHOD OF EMISSION SPECTROANALYSIS

Stanley B. Smith, Jr., Westford; Robert G. Schleicher, Winchester, and Jon N. Waterman, North Reading, all of Mass., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 8, 1983, Ser. No. 473,326
Int. Cl.³ G01J *3/18*; G01N *21/73*
U.S. Cl. 356—316 **11 Claims**



1. A method of spectroanalytical analysis for measuring the quantity of an analyte constituent in sample material comprising the steps of

exciting material to spectroemissive level,

dispersing radiation from said excited material into a spectrum,

positionally locating the output of a reference constituent of said material in said spectrum, said known constituent having a known wavelength offset from said analyte constituent in said spectrum,

shifting said spectrum said known wavelength offset,

exciting said sample material to spectroemissive level,

dispersing radiation from said excited sample material into a spectrum, and

measuring an output of said sample material spectrum at said known wavelength offset.

4,531,837

METHOD FOR MEASURING THE TRANSVERSE PROFILE OF THE HEAD OF A RAIL OF A RAILROAD TRACK

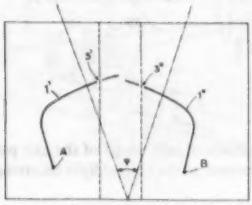
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Feb. 1, 1983, Ser. No. 463,051

Claims priority, application Switzerland, Feb. 25, 1982, 1149/82

Int. Cl.³ G01B *11/24*

U.S. Cl. 356—376 **17 Claims**



10. Device for the measurement of the transverse profile of the head of a railway track comprising, mounted on a carriage pulled along the track, a source of rays projecting a trace on the whole surface of the head of the rail and means to observe said trace from several points located outside of the plane of projection, characterized by the fact that it comprises means forming a particular point on the projected trace constituting a floating origin; by the fact that the means to observe the trace enable its observation from at least two directions forming an angle between them and with the plane of projection of the trace, said means to observe being located on either side of a vertical plane containing the longitudinal axis of the rail, and creating two partial reproductions of the trace each containing the image of the floating origin; by the fact that it comprises an electronic apparatus comprising means to superimpose the images of said floating origin of the partial reproductions of the trace and means angularly displacing these partial reproductions by an angle depending on the angles from which the trace is observed and reconstituting the totality of the transverse profile of the head of the rail.

4,531,838

METHOD AND DEVICE FOR CONTROLLING THE FILM THICKNESS OF EVAPORATED FILM

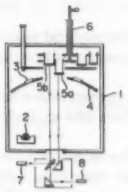
Mitsuharu Sawamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,481

Claims priority, application Japan, Mar. 26, 1981, 56-44457

Int. Cl.³ G01B *11/00*

U.S. Cl. 356—382 **5 Claims**



1. A device for controlling the film thickness of evaporated film, comprising:

a first monitor having a surface to which an evaporated film adheres;

a second monitor having a surface to which an evaporated film adheres;

means for evaporating films onto said surfaces of both of said monitors at once, said first and second monitors being disposed such that the evaporated film adheres to said surface of said first monitor at a different rate from that at which the evaporated film adheres to said surface of said second monitor;

means for applying light beams of the same wavelength to said first monitor and said second monitor; and

means for detecting the quantity of light applied by said applying means and reflected by each of said first and second monitors.

4,531,839

AUTOMATIC DISPENSER-MIXER

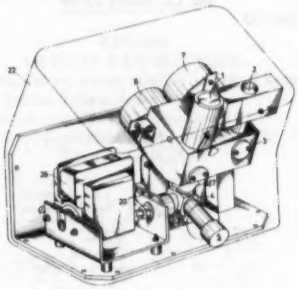
Michel Cunisse, Saint-Jean-de l'Union; Patrick Granier, Mazamet, both of France; Antoine D'Hollosy, AAn-de-Vecht, Netherlands, and Daniel De Pinho, Toulouse, France, assignors to Cavex-France, Sarl; Comat, Sarl and Microtec, Sarl, all of France

Filed Sep. 16, 1983, Ser. No. 533,375

Claims priority, application France, Sep. 17, 1982, 82 15916

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—110 **18 Claims**



1. An automatic dispenser-mixer apparatus comprising: a first reservior for a first material, a first dispenser opening of said first reservoir, a second reservoir for a second material, a second dispenser opening of said second reservoir, dispensing and metering means including a first sleeve, a first conveyor for said first material, said first conveyor being rotationally mounted in said first sleeve, a second sleeve, and a second conveyor for said second material, each said sleeve having an inlet connected to said first and second openings, respectively, and an outlet for each said material being dispensed and metered, separately controllable driving means for each said conveyor, said second conveyor being a piston having a calibrated notch rotatable within said second sleeve to a position adjacent the second opening, controlling coupling means between said driving means and said piston for locating said notch on said piston relative to the second opening, and means for receiving the metered materials from said outlets and mixing them.

4,531,840

SOLVENT PROPORTIONING AND MIXING APPARATUS AND SYSTEM

Keith S. Clark, Sunnyvale, Calif., assignor to Eldex Laboratories, Inc., Menlo Park, Calif.

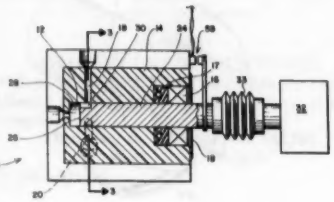
Filed Dec. 14, 1983, Ser. No. 561,219

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—142 **3 Claims**

1. A system for proportioning and mixing a solvent including a plurality of liquid components, which comprises a chamber having a plurality of inlet ports each connected to supply one of the plurality of liquid components, a member mounted in said chamber and being movable to different positions for selectively permitting entry of the liquid components to said

chamber through said plurality of inlet ports, different lengths of time the movable member is positioned to allow entry of each liquid component through each of said plurality of inlet ports serving to proportion the plurality of liquid components, and movement of said movable member within said chamber serving to mix the plurality of liquid components, an exit from



said chamber for the proportioned and mixed solvent, a motor with positional feedback connected to move said movable member, means connected to sense a position of said movable member, to determine a next position of said movable member, and to provide variable lengths of time the movable member is positioned to allow entry of each liquid comonent through each of said plurality of inlet ports.

4,531,841

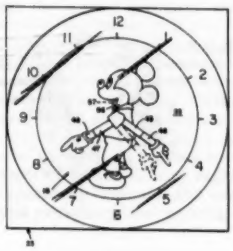
ELECTRONIC AUDIO-VISUAL TIMEPIECE

Norbert M. Puff, 427 Catalina Dr., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 446,642, Jul. 30, 1982, Pat. No. 4,466,743. This application Jun. 29, 1984, Ser. No. 626,544

Int. Cl.³ G04B *21/08;* **G04C** *19/00*

U.S. Cl. 368—63 **7 Claims**



1. An electronic audio-visual timepiece which incorporates a synthetically produced voice of a character to audibly tell the time and an animated display of the character so that the character's body movements visually indicate the time and may be in sychronization with the character's voice, said electronic audio-visual timepiece comprising:

a. a housing having a face plate;

b. time updating means for producing updated time information and for generating an updated time output signal, said time updating means being disposed in said housing;

c. processing means for processing said updated time output signal and for generating an audio drive input signal and a visual drive input signal, said processing means being disposed in said housing;

d. speech generating means for generating the synthetically produced voice of the character in a predetermined speech pattern in order to audibly tell the time in response to said audio drive input signal, said speech generating means being disposed in said housing; and

d. visually displaying means for visually displaying the character's body movements in order to visually indicate the time in response to said visual drive input signal, said visually displaying means being disposed in said housing, wherein the character's body movements may be in sychronization with the character's voice.

4,531,842

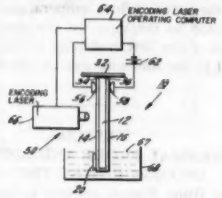
DISPOSABLE THERMOMETER PROBE AND RATING TECHNIQUE THEREFOR

Milton Schonberger, One Century Tower, Ft. Lee, N.J. 07024

Filed Oct. 31, 1983, Ser. No. 547,246

Int. Cl.³ G01K *15/00, 7/16*

U.S. Cl. 374—1 **20 Claims**



1. A method of rating a thermometer probe for being readable in a readout apparatus, wherein the probe comprises a temperature-sensing element which has an electrical characteristic that changes responsive to the temperature of the sensing element, and electric conductors electrically connected in circuit with the sensing element,

the method comprising:

subjecting the sensing element predetermined to a particular temperature, until the sensing element attains the particular temperature;

measuring the electrical resistance of the probe with the sensing element at the particular temperature;

comparing the measured electrical resistance of the probe with a standard electrical resistance; and

encoding the difference between the measured resistance and the standard resistance onto the probe for enabling later readout of the encoding.

4,531,843

CALORIMETER

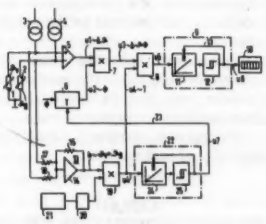
Hans Kühnlein, Nurnberg-Grossgrundlach, and Reinhard Stark, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,478

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208511

Int. Cl.³ G01K *17/06*

U.S. Cl. 374—40 **9 Claims**



1. In a calorimeter for the measurement of the heat quantity given up by a fluidic medium in at least one heat exchanger, including an acoustic flow velocity measuring device, and temperature sensors for the determination of the forward-return flow temperature difference, a multiplier for the formation of the product of the flow velocity and the forward-return

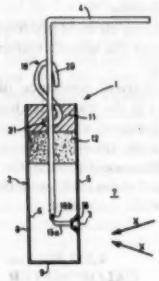
flow temperature difference, a quantizer for forming a pulse train at a frequency proportional to the product, and a cumulating counting device connected to the output of the quantizer for the pulses of the pulse train; the improvement comprising in that the flow velocity measuring device is activated only at predetermined measuring moments wherein the frequency of these measuring moments is generally proportional to an auxiliary variable representative of a measure for the significance of a possible change of at least one parameter determining the heat output on the measured result, said parameter being chosen from the group consisting of a generally heat output-proportional signal and a signal proportional to the time-wise gradient of the forward flow temperature, and a second multiplier connected to the input of the quantizer in which the output signal of the first multiplier is multiplied with a value proportional to the timewise spacing between two measuring moments.

4,531,844

THERMAL PROBE AND APPARATUS INCORPORATING THE SAME

Martin Juras, Dijon, France, assignor to Societe Bourguignonne de Mercanique, France

Continuation of Ser. No. 434,240, Oct. 14, 1982, abandoned. This application Dec. 4, 1984, Ser. No. 677,895
Claims priority, application France, Oct. 14, 1981, 81 19301
Int. Cl.³ G01K *1/00*
U.S. Cl. 374—208 **22 Claims**



1. A thermal probe for sensing the resultant ambient temperature produced by the combined effects of thermal convection and infrared radiation at the sight of said probe, said probe comprising:

a rigid support element in the form of an enclosure, said enclosure having an internal surface exhibiting good thermal conductivity and an exterior surface closely approximating the properties of a blackbody so as to absorb said infrared radiation and respond to the effects of said thermal convection;

thermal transducer means mounted within said enclosure so as to be thermally coupled to the interior surface thereof, said transducer providing an electrical signal related to the resultant ambient temperature, and

means for coupling said electrical signal from said transducer externally of said enclosure.

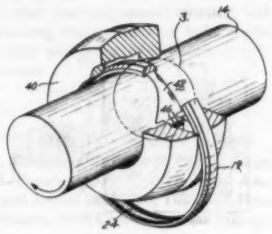
4,531,845

BEARING LUBRICATION DEVICE

Hooshang Heshmat, Latham, N.Y., assignor to Reliance Electric Company, Greenville, S.C.

Filed Jan. 9, 1984, Ser. No. 569,526
Int. Cl.³ F16C *33/10*; F16N *7/16*
U.S. Cl. 384—406 **14 Claims**

1. In combination, a bearing member structure, a rotatable shaft journaled horizontally in said member structure, a lubricant reservoir disposed beneath said shaft, a generally circular ring member of a substantially larger diameter than said shaft disposed eccentrically around said shaft and supported by the upper side of said shaft in substantially an area of closest proximity thereto, and extending into said reservoir for transferring



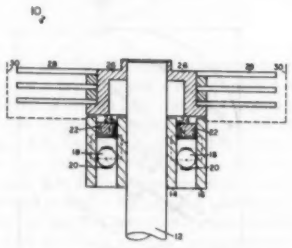
lubricant from said reservoir to the surface of said shaft during rotation thereof, and means extending into the ring member to a point near the area of closest proximity between an inner surface of the ring member and said shaft for facilitating transfer of lubricant from the ring member to the shaft surface as said ring member is rotated by said shaft.

4,531,846

COMPACT FERROFLUID SEAL AND BEARING ASSEMBLY

Kuldip Raj, Merrimack, N.H., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed Dec. 27, 1983, Ser. No. 565,333
Int. Cl.³ B65D *33/74*; F16C *1/24, 33/74*
U.S. Cl. 384—478 **8 Claims**



1. A compact ferrofluid seal and radial bearing assembly adapted to provide a ferrofluid seal and radial support to a rotatable shaft, which assembly comprises:

(a) a magnetically permeable bearing means to support a rotatable shaft which bearing means is composed of an inner and outer spaced-apart race elements, a plurality of moveable elements disposed between the inner and outer race elements and a cage means to retain the moveable elements within the race elements, the inner and outer race elements adapted for movement relative to each other and the moveable elements;

(b) a ferrofluid seal means to seal the rotatable shaft, which ferrofluid seal apparatus comprises a radially-polarized, annular, permanent magnet which acts as both a pole piece and a magnet having a one end and another end, the one radially-polarized end of one polarity of the peramanent magnet in a magnetic flux relationship with the inner or outer race element and the other radially-polarized end of the opposite polarity of the magnet extending into a close, noncontacting relationship with the inner surface of the outer or the outer surface of the inner race element to define a radial gap and ferrofluid retained in the radial gap

by magnetic flux from the radially polarized permanent magnet to provide a ferrofluid exclusion seal adjacent the one side of the bearing means; and

(c) the magnetic flux lines of the ferrofluid seal apparatus forming a complete closed magnetic flux circuit passing through the radially-polarized magnet, the ferrofluid in the radial gap, the inner and outer race, and the moveable element.

4,531,847

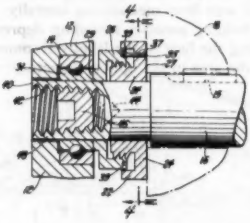
SHAFT-MOUNTED EQUIPMENTS

Erwin F'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1983, Ser. No. 555,790

Int. Cl.³ F16C *35/063*

U.S. Cl. 384—519 **11 Claims**



1. In an assembly that comprises a housing having opposed walls, a bearing structure located on each of said walls, a circular shaft having longitudinally spaced areas thereof extending within the bearing structures whereby said bearing structures support the shaft for rotational motion around its longitudinal axis, operating mechanism mounted on the shaft in the space between the bearing structures, and shim means between the operating mechanism and one of the bearing structures: the improvement wherein the shim means comprises two rotary collars adapted to encircle the shaft, one collar having an internal helical thread thereon, the other collar having an external helical thread thereon, the internal thread and external thread being meshed together whereby relative rotation of one collar on the other varies the axial length of the collar assembly, said collars having flat radial annular end surfaces of substantial area engageable respectively with the operating mechanism and said one bearing structure to prevent axial play of the operating mechanism on the shaft.

4,531,848

DOT MATRIX PRINT HEAD

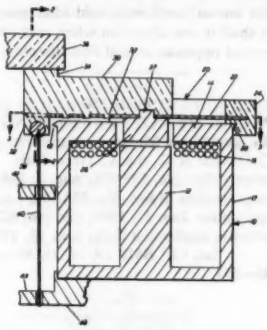
Royden C. Sanders, Jr., Burton Hwy., Wilton, N.H. 03086, and John L. Forsyth, Box 182, Newton Junction, N.H. 03851, assignors to Royden C. Sanders, Jr., Wilton and John L. Forsyth, Newton Junction, both of, N.H.

Filed Oct. 27, 1982, Ser. No. 436,950

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **12 Claims**

1. A dot matrix print head comprising a solenoid assembly having a magnetic return path constituting a metallic plate adjacent to its upper surface, a first positioning means forming a part of said plate, a printing pin carried by a spring assembly, a second positioning means forming a part of the spring assembly, said second positioning means being adapted to resiliently engage said first positioning means and being expandable to permit sliding engagement with the first positioning means and to hold the spring assembly locked onto the solenoid assembly, the metallic plate having detent means engageable by corresponding expandable detent means carried by the spring assembly and constituting the second positioning means, said first positioning means being circumferential and the second positioning means engaging the first positioning means around more than 180° of an arc, a pair of arms carried by the spring assembly constituting the second positioning means, said arms



being adapted to engage said first positioning means around more than 180° of arc thereof and being expandable to permit sliding engagement with the first positioning means and to hold the spring assembly locked onto the solenoid assembly.

4,531,849

RIBBON FEED MECHANISM

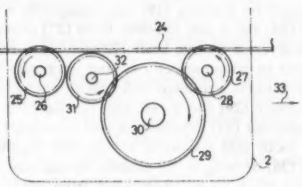
Koichi Dobashi, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 28, 1984, Ser. No. 655,939

Claims priority, application Japan, Sep. 29, 1983, 58-149591[U]

Int. Cl.³ B41J *33/04, 33/22*

U.S. Cl. 400—229 **3 Claims**



1. A ribbon feed mechanism for a printer, comprising:

(a) a frame having a frame rack;

(b) a carriage movably supported on said frame and movable with respect to said frame rack, said carriage supporting a ribbon cassette having a ribbon takeup shaft;

(c) a first drive gear rotatably mounted on said carriage and held in direct mesh with said frame rack at all times, said first drive gear being rotationally and translatably movable with respect to said carriage;

(d) a second drive gear rotatably mounted on said carriage and held in direct mesh with said frame rack at all times, said second drive gear being rotationally and translatably movable with respect to said carriage;

(e) an output gear rotatably mounted on said carriage and spaced from said frame rack, said output gear being coupled with said ribbon takeup shaft and;

(f) an idler gear rotatably mounted on said carriage and held in direct mesh with said output gear at all times, said first drive gear being movable into and out of mesh with said idler gear;

(g) wherein said first drive gear is brought into direct mesh with said idler gear and said second drive gear is brought

out of mesh with said output gear to rotate said output shaft in one direction when said carriage is moved in a first direction, and said second drive gear is brought into direct mesh with said output gear and said first drive gear is brought out of mesh with said idler gear to rotate said output shaft in one direction when said carriage is moved in a second opposite to said first direction.

4,531,850

LINE SPACING DEVICE FOR PRINTING MACHINES

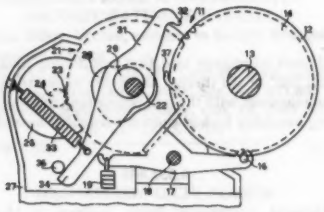
Franco Valle. and Pietro Musso, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 518,976, Aug. 2, 1983, abandoned, which is a continuation of Ser. No. 252,580, Apr. 9, 1981,. This application Jun. 21, 1984, Ser. No. 623,523

Claims priority, application Italy, Apr. 15, 1980, 67580 A/80

Int. Cl.[3] **B41J** *19/14, 19/80*

U.S. Cl. 400—551 **18 Claims**



1. A line spacing device for a printing machine comprising a rotatable paper support platen (**12**); a toothed wheel (**14**) connected with said platen (**12**); a detent device (**17**) for maintaining the platen (**12**) in the position to which the platen (**12**) has been moved, including a detent lever with a detent element (**16**) urged by a spring (**19**) and engageable with the toothed wheel (**14**) and a cam follower lever (**37**) connected with said detent lever; a motive shaft (**22**) having a rest position and arranged to rotate selectively and cyclically in a clockwise direction and in a counterclockwise direction; means mounting an eccentric (**29**) and a cam (**28**) on said motive shaft (**22**); a pawl member (**31**) mounted on said eccentric (**29**) and including a tooth (**32**) cooperative with said toothed wheel; and means (**36**) defining a rest position of said pawl member causing said tooth to be disengaged from said toothed wheel; wherein said pawl member responds to the rotation of said eccentric (**29**) for causing said tooth to describe a trajectory having a part which interferes with said toothed wheel (**14**); wherein said tooth (**32**) travels through said part in one or the other direction in accordance with the clockwise or counterclockwise rotation of said motive shaft (**22**) for the incremental bidirectional rotation of the platen (**12**); wherein said detent element (**16**) is engaged with said toothed wheel (**14**) and said tooth (**32**) is disengaged from said toothed wheel (**14**) in the rest position of said motive shaft (**22**); and wherein said cam (**28**) engages said cam follower lever (**37**) during the rotation of the motive shaft (**22**) for releasing said detent element (**16**) from the toothed wheel (**14**) before the engagement of the tooth (**32**) of said pawl member (**31**) with the toothed wheel (**14**).

4,531,851

MARK DETECTOR FOR PRINTERS

Kouichi Kondo, and Tadahisa Oikawa, both of Iwate, Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Aug. 13, 1983, Ser. No. 528,079

Claims priority, application Japan, Sep. 6, 1982, 57-153979

Int. Cl.[3] **B41J** *11/46*

U.S. Cl. 400—583.3 **11 Claims**

1. A printer for printing labels in a label web, wherein the labels of the web have optically detectable marks thereon at predetermined intervals, the printer comprising:

printing means for applying imprints on the label web;

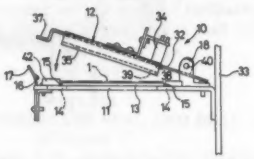
a supporting base spaced from the printing means along the path of feed of the label web, and to which and past which the label web is fed; feed means for feeding the label web to and past the supporting base and also to and past the printing means;

a label web holding member supported to the base for holding the face of the label web to the base as the label web is fed to and past the base;

an optical detector in the area of the label web holding member for detecting the marks on the label web; the detector being connected with the printing means for controlling the timing of the printing of the label web by the printing means;

guide means at the supporting base for guiding the feeding of the label web past the supporting base and for preventing the label web from meandering laterally;

the label holding member including depressing means for depressing the face of the label web onto the supporting base in the area of the optical detector;



the label holding member being hingedly attached to the base at one lateral side of the label web for causing the depressing means to hold the label web to the base when the label holding member is hingedly moved toward and is at the base and for enabling the labelholding member to be hingedly lifted away from the base, enabling placement of the label web on the base and removal of the label web therefrom;

locking means for locking the label holding member at the supporting base in a position for the depressing means to hold the label web to the supporting base; the locking means including an engagement portion formed at the opposite lateral side of the label holding member from the hinged attached one side thereof, and including a locking element on the base for engaging the engagement portion on the label holding member; and

a spring connected at the label holding member for normally biasing it to hingedly lift off the supporting base and out of a position which holds the label web to the supporting base.

4,531,852

PRINTING APPARATUS OF MODULAR CONSTRUCTION HAVING A ROTATABLE PRINTHEAD AND PLURAL PRINT STATIONS

Werner Mädge, Villingen-Schwenningen; Peter Vogelhuber, Brigachtal; Dieter Stellmach, Bad Dürrheim, and Josef Hauger, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparatus GmbH, Villingen, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,784

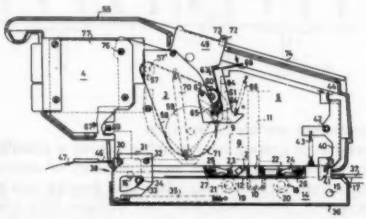
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208111

Int. Cl.[3] **B41J** *29/02*

U.S. Cl. 400—692 **9 Claims**

1. A printing apparatus of a modular construction comprising a printing mechanism having laterally spaced first side walls, an individual form feed part including a first printing base and having laterally spaced second side walls, and a con-

tinuous form feed part including a second printing base and having laterally spaced third side walls, said printing mechanism including a printing head located between said first side walls, said printing head being pivotally mounted for pivoting said printing head from a first position relative to said individual form feed part for printing individual forms or form sets to a second position relative to said continuous form feed part for printing a continuous form or form sets, said printing apparatus having a front end and a rear end with said first, second and third side walls extending in the direction between the front and rear ends, said first and third side walls being located above said second side walls, wherein the improvement comprises that said individual form feed part comprises a removable base unit arranged to be supported on a table below said printing mechanism so that the individual form or form set is fed horizontally closely above the level of the table, said base unit and said printing mechanism extend from the front end toward the rear end and said second printing base of said



continuous form feed part is located above said removable base unit and is positioned between said printing mechanism and the rear end so that printing on said second printing base is visible and is located below eye level, said printing mechanism and said continuous form feed part are pivotally mounted relative to said individual form feed part so that said printing mechanism and continuous form feed part can be pivoted outwardly away from said individual form feed part, a first click-stop device formed on said individual form feed part and said printing mechanism secures said printing mechanism in the operative position relative to said individual form feed part, first pivot means for pivoting said printing mechanism relative to said first printing base located at the end of said first printing base located closer to the rear end of said printing apparatus, and second pivot means for pivoting said second printing base relative to said printing mechanism closer to the rear end of said printing apparatus and spaced upwardly from said first pivot means.

4,531,853

WRITING INSTRUMENT WITH A METAL WIRE POINT

Masao Hirabayashi, Kawagoe, and Takeshi Mizutani, Kuwana, both of Japan, assignors to Shachihata Industry Co., Ltd., Japan

Filed Oct. 29, 1982, Ser. No. 437,624
Claims priority, application Japan, Nov. 2, 1981, 56-176244
Int. Cl.³ B43K *1/10*
U.S. Cl. 401—265 **11 Claims**

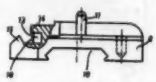
1. A writing instrument, comprising: a metal writing point formed by several fine metal wires arranged in a single circumferential row about a central axis to define a centrally-located longitudinal hollow space extending along a substantial portion of the length of said wires, said hollow space being adapted to receive at least partially an ink feeding core, said several wires at one end portion thereof having a substantially hemispherical end face which forms a metal writing tip and being inwardly compressed towards said central axis to form flattened capillary paths between circumferentially adjacent wires which lead to said end face.

4,531,854

DEVICE FOR HOLDING SHEETS PROVIDED WITH PERFORATIONS

Anthony Handler, Mühlbachergasse 14, Vienna, Austria (A-1130)

Filed Aug. 8, 1983, Ser. No. 521,052
Claims priority, application Austria, Aug. 23, 1982, 3189-82; Mar. 11, 1983, 871-83
Int. Cl.³ B42F *3/04, 13/20*
U.S. Cl. 402—27 **8 Claims**



1. A device for holding sheets having perforations, preferably spatially fixed endless perforations, comprising:

(a) at least one loose holding loop member having two limbs, said loop member engaging into perforations in the sheets to be held,

a first limb of the holding loop member being smooth with a continuous cross section at least in its anchor region,

a second limb of the holding loop member having a portion which is formed thereon which projects laterally beyond the outer surface of said second limb; and

(b) a base body portion into which is fitted and anchored said first limb of said holding loop member with said first limb normal to the top thereof in a bore therein,

said base body portion including a retaining recess having a projection extending thereover and into which said laterally projecting portion of said second limb of said holding loop member is resiliently engaged in the closure position of said holding loop member.

4,531,855

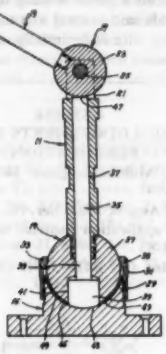
ADJUSTABLE ARM

Frederick A. Wallis, 9 Mosaic St., Shelley, Western Australia, Australia

PCT No. PCT/AU83/00060, § 371 Date Jan. 6, 1984, § 102(e) Date Jan. 6, 1984, PCT Pub. No. WO83/04078, PCT Pub. Date Nov. 24, 1983
PCT Filed May 12, 1983, Ser. No. 576,374
Claims priority, application Australia, May 12, 1982, PF3970
Int. Cl.³ F16C *11/06*
U.S. Cl. 403—55 **6 Claims**

1. An adjustable arm having a knuckle joint at one end and a ball and socket joint at the other end, a push rod extending axially along said arm and slidably mounted therein, one end of the rod bearing against the eye of the knuckle joint and the other end of the rod being against the socket of the ball and

socket joint and means for applying a compressive force to said rod comprising a collar screwed onto the socket over the ball



for simultaneously locking both joints against relative movement.

4,531,856

METHOD TO JOIN TWO ELEMENTS, AND A JOINT ACCORDING TO THE METHOD

Sven R. V. Gebelius, Drottningholmsvägen 195, Bromma, Sweden (S-161 36)

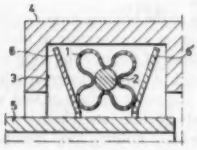
PCT No. PCT/SE81/00324, § 371 Date Jun. 15, 1982, § 102(e) Date Jun. 15, 1982, PCT Pub. No. WO82/01488, PCT Pub. Date May 13, 1982

PCT Filed Nov. 4, 1981, Ser. No. 388,511

Claims priority, application Sweden, Nov. 4, 1980, 8007741; Nov. 4, 1980, 8007742; Aug. 20, 1981, 8104947

Int. Cl.³ F16D *1/06*

U.S. Cl. 403—366 **7 Claims**



1. A joint for two elements wherein one element to be joined has an internal peripheral surface disposed in surrounding spaced relationship with respect to the external peripheral surface of the second element, comprising:

at least one substantially ring-shaped expandable tubular member disposed between the internal and external peripheral surfaces of the respective elements to be joined;

an explosive charge enclosed within said tubular member to expand said tubular member when ignited into contacting engagement with said internal and external peripheral surface;

igniter means operatively associated with said explosive charge to ignite said explosive charge;

at least one restricting surface in the space between said internal and external peripheral surfaces to restrict expansion of said tubular member; and

at least one holding and sealing member disposed between said internal and external peripheral surfaces and between an external side surface of said tubular member and said at least one restricting surface comprising at least one spring ring having a substantially frusto-conical cross-sectional configuration, so that when expanded said tubular member deforms said at least one spring ring by forcing it against said at least one restricting surface thereby reducing the inner diameter and increasing the outer diameter of said at least one spring ring to cause the respective inner and outer edges thereof to tightly engage the said internal and external peripheral surfaces, respectively, of the elements to be joined to increase the holding and sealing properties of the finished joint.

4,531,857

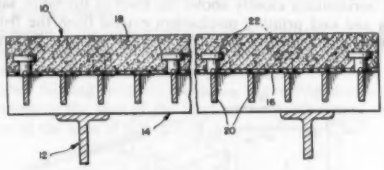
PREFABRICATED PAVEMENT MODULE

Neal H. Bettigole, 89 Howard Dr., Old Tappan, N.J. 07675

Filed Sep. 30, 1982, Ser. No. 428,861

Int. Cl.³ E01C *5/22*

U.S. Cl. 404—44 **12 Claims**



1. A pavement module comprising:

an open-lattice grating base member having a plurality of primary load bearing bars and a plurality of secondary load bearing bars, said secondary load bearing bars intersecting and interlocked with said primary load bearing bars to distribute load transverse to said primary load bearing bars, said primary and secondary load bearing bars forming an integral modular unit adapted to be supported on and transmit forces to main structural framing members, said grating base member having a top surface and bottom surface;

a plurality of shear connectors integrally formed on said top surface of said grating base member; and

a concrete wear member fixed to said grating base member above said top surface of said grating base member, said concrete wear member having a planar top surface and a planar bottom surface, said planar bottom surface essentially coplanar with said top surface of said grating base member so that said concrete wear member does not fill the interstices of said grating base member, said shear connectors embedded within said concrete wear member to effect horizontal shear transfer and to prevent vertical separation between said concrete wear member and said grating base member.

4,531,858

PARTIALLY SEPARABLE ATTACHMENT DEVICE FOR SHEET METAL SCREED AND STAKE ASSEMBLIES

Robert H. Kirtley, Jr., 3033 - 35th Ave., N., Birmingham, Ala. 35027

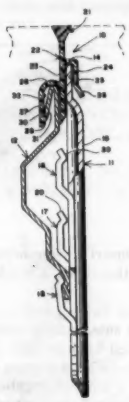
Filed Oct. 14, 1983, Ser. No. 542,176

Int. Cl.³ E01C *11/02*

U.S. Cl. 404—48 **7 Claims**

1. A partially separable attachment device for use with sheet metal screed and stake assemblies of the type wherein the screed has a reversely-bent marginal upper end portion providing a longitudinally-extending-recess, open at the bottom, and an elongated sheet metal stake member having a blunt point at the lower end and a square cut edge at the upper end, comprising, in combination, an elongated member of uniform cross-sectional shape having, along its length, a head portion integrally formed with a depending body portion, said body portion comprising a vertical wall portion integrally formed at one side with a first laterally-offset wall portion defining an inverted, longitudinally-extending recess, open at the bottom, for the interfitting reception of the upper end portion of the screed stake, an other side of said vertical wall portion being inte-

grally formed with a second laterally-offset wall portion defining a second longitudinally-extending recess, open at the bottom, for the interfitting reception of the reversely-bent marginal upper end portion of the screed, means for interhookingly securing said reversely-bent marginal upper end portion



of the screed within said second longitudinally-extending recess, said elongated member being fabricated of a flexible, synthetic plastic material, and means enabling the manual stripping away of said head portion of said elongated member from said body portion thereof

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4,531,859

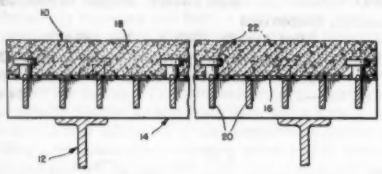
PREFABRICATED PAVEMENT MODULE

Neal H. Bettigole, 89 Howard Dr., Old Tappan, N.J. 07675

Continuation-in-part of Ser. No. 428,861, Sep. 30, 1982,. This application Jun. 6, 1983, Ser. No. 501,145

Int. Cl.³ E01C *5/22*

U.S. Cl. 404—73 **5 Claims**



1. A method of making a pavement module comprising:

forming an open-lattice grating base member having a top surface and bottom surface by intersecting and interlocking a plurality of primary load bearing bars with a plurality of secondary load bearing bars to distribute load transverse to said primary load bearing bars;

forming a plurality of shear connectors on said top surface of said grating base member; and

providing a concrete wear member having a planar top surface and a planar bottom surface fixed to and on top of said grating base member above said top surface of said grating base member, said planar bottom surface of said concrete wear member essentially coplanar with said top surface of said grating base member so that said concrete wear member does not fill the interstices of said grating base member; and

embedding said shear connectors within said concrete wear member to effect horizontal shear transfer and to prevent vertical separation between said concrete wear member and said grating base member.

4,531,860

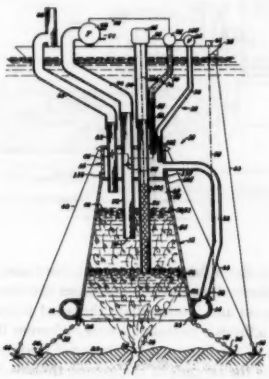
DEEP SEA OIL SALVAGE MEANS

Eugene R. Barnett, 6268 Windsor Dr., Indianapolis, Ind. 46219

Filed Sep. 20, 1979, Ser. No. 77,388

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—60 **8 Claims**



1. A self-contained, underwater mounted, portable, positionable, deep sea oil salvage means and separator of oil, gas, and water, comprising, in combination:

a flexible sleeve means,

means holding operatively open the lower end of the sleeve means to provide that it is of downwardly-opening nature,

anchor means operatively connected to the sleeve means to retain it in the situs of the oil leak and to assure that the sleeve means provides a collection chamber for oil and gas emerging from the leak,

sealing means operatively sealing the upper end of the sleeve means,

control means for discharging oil and/or gases from the sleeve means to associated receiving means,

there being provided buoyant means to hold the upper end of the said sleeve means upwardly, thus providing that the said sleeve means is a downwardly-opening collection chamber,

in a combination in which a tube means extends into the upper portion of the sleeve means, and releases gas collected in the sleeve means, in a controlled manner,

and including a tube means which extends into the interior of the sleeve means for controlled discharge of oil collected in the sleeve means,

and also including a sensor means for detection of the presence of layers or regions of oil/water, of oil, and of gas collected in the sleeve means,

and in which control means are provided for automatically controlling the discharge of gas by the gas-releasing tube and the discharge of oil by the oil-discharge tube,

the control means being responsive to the said sensor means, thus maintaining the desired layers or regions of oil/water, oil, and gas, respectively in the sleeve means.

4,531,861

ADHESIVELY SECURED ANCHOR ROD

Maurice D. Kash, P.O. Box 874, Broken Arrow, Okla. 74012

Filed Aug. 15, 1983, Ser. No. 523,117

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **3 Claims**

1. An adhesively secured anchor rod for installation within an adhesive containing bore of a base structure, and comprising a bar having a first threaded portion provided at one end thereof and a second threaded portion provided at the opposite

end thereof, an intermediate threaded portion interposed between the first and second threaded portions, the first threaded portion comprising standard threads and the second threaded portion and intermediate threaded portion comprising a relatively large thread, the second threaded portion being adapted for initial insertion into the adhesive containing bore for effe-

ciently mixing the adhesive within the bore and around the second and intermediate threaded portions in order to securely retain the second and intermediate threaded portions embedded with the adhesive containing bore, wherein the direction of the threads of the intermediate threaded portion is opposite the direction of the threads of the second threaded portion for resisting accidental backing out of the anchor rod.

4,531,862

MANIFOLD TO UNIFORMLY DISTRIBUTE A SOLID-LIQUID SLURRY

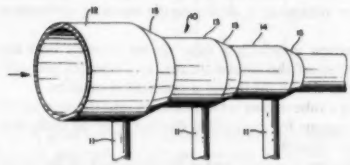
Kenneth C. Kern, Lake Hiawatha, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 285,003, Jul. 20, 1981, Pat. No. 4,413,934. This application May 12, 1983, Ser. No. 493,772

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ B65G *53/52*

U.S. Cl. 406—155 **2 Claims**



1. The method of uniformly dividing a coal-liquid hydrocarbon slurry stream including coal particles of different size ranges mixed and suspended in said liquid flowing in a main conduit into smaller, but substantially equal, slurry side streams of uniform coal particle size distribution flowing in a plurality of distributor conduits fed from said main conduit, comprising the steps of progressively decreasing the diameter of said main conduit to maintain substantially equal slurry flow velocity throughout the length of said main conduit as said side streams are withdrawn, locating a plurality of distributor conduits immediately adjacent and upstream of each said main conduit progressive diameter decreases, and creating turbulence and an associated pressure drop in the main conduit adjacent a sharp edge terminal end portion of each of said distributor conduits at their respective points of communication with the interior of said main conduit whereby improved and substantially uniform coal particle size distribution will result in each of said distributor conduits.

4,531,863

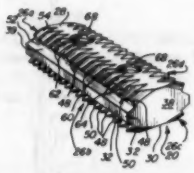
THREAD-CUTTING APPARATUS

Darrel E. Smith, Rockford, Ill., assignor to The Ingersoll Cutting Tool Company, Rockford, Ill.

Filed Jan. 31, 1984, Ser. No. 575,350

Int. Cl.³ B23G *5/18*; B23D *77/02*

U.S. Cl. 407—113 **4 Claims**



1. An indexable insert for mounting on a holder to form a continuous helical thread on a workpiece surface, the insert comprising:

at least two rows of cutting teeth, each said row of cutting teeth including a substantially planar forward cutting surface and a grooved back surface intersecting said forward cutting surface to define a cutting edge, said grooved back surface defining a row of parallel ridges extending rearwardly of said forward cutting surface.

first and second opposite, substantially parallel substantially planar locating surfaces, each intersecting a respective one of said grooved back surfaces and being contiguous therewith, and

a third substantially planar locating surface located rearwardly of both said rows of cutting teeth and oriented perpendicular to said first and second locating surfaces;

an included angle A of greater than 180° being defined between each of said first and second locating surfaces and the ridges of the respective grooved surface contiguous therewith.

4,531,864

CUTTING INSERT

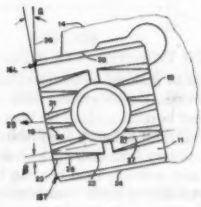
Sven O. Bylund, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Apr. 28, 1983, Ser. No. 489,578

Claims priority, application Sweden, May 17, 1982, 8203080

Int. Cl.³ B23P *15/28*; B26D *1/00, 3/00*

U.S. Cl. 407—114 **14 Claims**



11. A cutting insert for use in a milling cutter, said insert comprising:

first and second opposing, substantially parallel side surfaces,

more than two edge surfaces interconnecting said side surfaces and each being of smaller size than each of said side surfaces,

the intersection of at least one of said edge surfaces and one of said side surfaces defining a cutting edge having first and second ends,

a plurality of grooves formed in said one side surface and

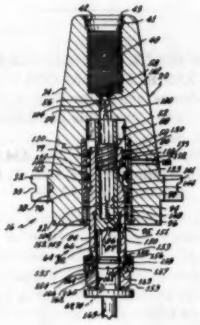
extending from said cutting edge, each said groove including a pair of side walls which converge toward a bottom of said groove, a first of said side walls being located closer to said first end of said cutting edge and a second of said side walls being located closer to said second end of said cutting edge, said second side wall being planar and extending obliquely from said cutting edge in a direction away from said first end.

4,531,865

TAPPING ATTACHMENT ADAPTED FOR NUMERICAL COMPUTER CONTROL

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Filed Jul. 21, 1982, Ser. No. 400,449
Int. Cl.³ B23B *47/24*
U.S. Cl. 408—139 **3 Claims**



1. A tapping attachment including means providing a body part, a rotatable spindle carried by said body part which is relatively movable axially relative to said body part, said spindle having an axial bore and A compression spring means carried in said bore in the form of a cylindrical member constructed at least in part as a helical spring and having a head part threadably engaging said bore of said spindle and providing a compression cushion allowing relative axial movement as between said spindle and said body part against said compression spring means, said compression spring means being adjustable to vary the amount of cushion independent of the position of said spindle relative to said body part; and a tension spring means in said bore connected to said compression spring means providing a tension cushion allowing relative axial movement as between said spindle and said body part against said tension spring means.

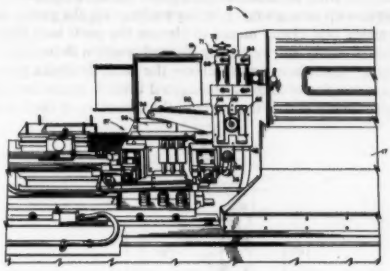
4,531,866

CHASER POSITION CONTROL

John Leonard, Jr., Fayetteville, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 27, 1982, Ser. No. 424,611
Int. Cl.³ B23G *1/02*
U.S. Cl. 408—158 **4 Claims**

1. In thread cutting apparatus comprising a headstock carrying a die head having a plurality of chaser holders mounted for radial movement therein, means for controlling the radial position of said chaser holders comprising an annular control member mounted on said headstock for movement axially thereof, a plurality of bell cranks carried by said die head, each bell crank being operably connected to said control member and one of said chaser holders and effective to move said chaser holders radially in response to axial movement of said control member, an additional bell crank, means mounting said additional bell crank in said headstock for rocking movement about an axis transverse to the axis of said die head, means responsive to rocking movement of said additional bell crank to displace said annular control member axially and thereby displace said chaser holders radially and means responsive to



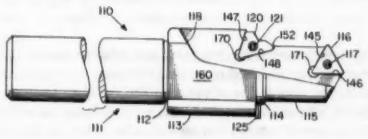
axial movement of said headstock during threading to rock said additional bell crank and thereby move said chaser holders radially.

4,531,867

CUTTING TOOL

Craig Benhase, Loveland, Ohio, assignor to Dexport Tool Company, Cincinnati, Ohio

Filed Feb. 16, 1984, Ser. No. 580,622
Int. Cl.³ B23B *51/08*
U.S. Cl. 408—224 **7 Claims**



1. A cutting tool comprising in combination, a bar having three cylindrical surfaces, the first cylindrical surface adapted to fit a chuck of a machine tool, a second cylindrical surface lying below said first cylindrical surface, a third cylindrical surface lying below said second cylindrical surface, said two last named surfaces having flat surfaces formed on opposite sides thereof, flutes formed on said last named surfaces, a triangular cutting element indexibly secured to said third cylindrical surface at its lower end and lying within said flute formed on the second and third cylindrical surfaces, a second cutting element releasably secured to said second cylindrical surface, said second cutting element having five cutting edges, and a third cutting element indexibly secured to said second cylindrical surface and lying within a flute formed on said surface opposite of the previously described flute.

4,531,868

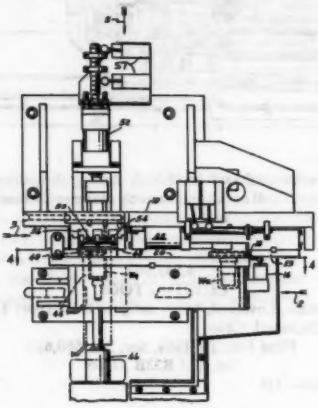
BROACHING MACHINE

Leonard A. Gabriele, Warren, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jan. 19, 1982, Ser. No. 340,883
Int. Cl.³ B23D *37/00*; B65G *15/64*
U.S. Cl. 409—269 **10 Claims**

1. A broaching machine comprising a horizontal support surface, input means comprising an inchute in which a series of aligned abutting parts are advanced into preliminary loading position on said surface against stop means, feed means movable in a horizontal direction transverse to the array of aligned parts in preliminary loading position and engageable with selected ones of the parts to advance them horizontally toward preliminary located aligned positions, final horizontal locator

means having accurate locating surfaces above the parts in preliminary located position to locate the parts in accurately located horizontally aligned positions, vertical locator means above said horizontal locator means having downwardly facing locating surfaces, vertically movable clamp means engageable with downwardly facing surfaces on the parts, means for raising said clamp means to elevate the parts into final located horizontally and vertically aligned position determined by said locating surfaces and to clamp the parts firmly in final located position for broaching, elongated broach means movable longitudinally across the parts in the direction of their horizontal



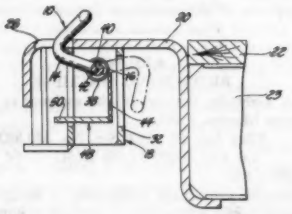
alignment, means for lowering said clamp means to provide for return of the finished parts to preliminary aligned position, and discharge means for advancing the finished parts in the direction of alignment thereof into an outchute, in which the discharge means comprises an unloading bar having recesses for receiving the parts in preliminary located aligned position below the final accurately located broaching position of the parts, and means for moving said bar longitudinally after the parts have been returned from final broaching position into the recesses in said bar to advance the finished parts to said outchute.

4,531,869

RETRACTABLE TIE-DOWN DEVICE

Davis L. Hemmings, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 616,632
Int. Cl.³ B60P 7/08
U.S. Cl. 410—107 **8 Claims**



1. A retractable tie-down device adapted for use with a trailer frame to attach tie-down straps for use in securing cargo atop the trailer comprising:

a shaped attachment having a strap engaging portion with two parallel V-shaped legs extending from a center connecting bar, a pair of mounting arms extending outwardly from the ends of the V-shaped legs opposite the connecting bar;

a housing mounted below the upper surface of said trailer frame, said housing having mounting apertures therein adapted to receive said mounting arms so as to allow rotation of the attachment;

biasing means having one end attached to the attachment means and operating to rotate the attachment into a retracted position; and

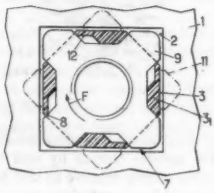
an activating tab attached to said biasing means and extending away from said biasing means so that a downward force applied to said activating tab will overcome the biasing means and rotate the shaped attachment about the axis defined by the mounting arms to a position where a portion of the attachment means is above the surface of the trailer for attachment of tie-down straps.

4,531,870

DEVICES FOR SECURING OBJECTS TO METAL SHEETS ACCESSIBLE FROM ONLY ONE SIDE

Richard Moryl, Eaubonne, and Roger Bouery, Valmondois, both of France, assignors to Compagnie de Materiel et D'Equipements Techniques, Senlis, France

Filed Nov. 25, 1981, Ser. No. 324,950
Claims priority, application France, Dec. 1, 1980, 80 25481
Int. Cl.³ F16B 37/04
U.S. Cl. 411—108 **6 Claims**



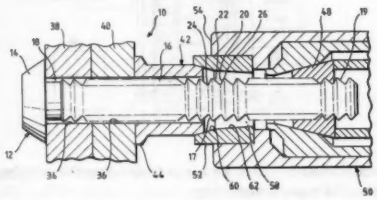
1. The combination comprising a rigid perforated sheet defining a square mounting hole and a device for securing an object by screwing to the rigid perforated sheet, said device comprising a one-piece cage which includes a threaded part adapted to be threadably coupled to a complementary threaded part by effecting relative turning movement between said threaded part and said complementary threaded part in a predetermined coupling direction, said cage including a socket having a generally prismatic shape and an octagonal base to establish a cross-sectional configuration permitting insertion of said socket into the mounting hole of the rigid perforated sheet, one end of said socket including a transversely extending collar adapted to bear on edges of said hole when said socket is inserted therein, wherein said threaded part includes four identical radial tabs extending in two diametrical directions perpendicular to each other thereby forming a cross-head, said tabs having a profile such that the cross-head defines a small clearance with said square hole, said socket adapted to be inserted with a slight play into the square hole, said socket including plural cut-out portions therein to define four identical longitudinal windows offset angularly by 90° with respect to each other and adapted to receive jointingly a respective one of the four tabs of the threaded part, and means for permitting said threaded part to rotate only through an angle of 45° in the coupling direction between a first position when said threaded part is first introduced into the square hole and a second position when at least the coupling of the complementary threaded part with said first-mentioned threaded part is terminated, wherein said means permitting rotation through only 45° includes plural lateral walls of said socket in confronting and closely-spaced relationship with a respective side of

said hole when said threaded part is in said first position, each said lateral wall including means defining an engagement surface on an outer face of said lateral wall, said engagement surface defining means for engaging said respective side of said hole during turning movement of said threaded part in said coupling direction to thus permit said threaded part to be turnably moved from said first position and into said second position.

4,531,871
MULTIGRIP FASTENER

Jerry A. Sigmund, Bala Cynwyd, Pa., assignor to Aerpat A.G., Zug, Switzerland

Filed Apr. 20, 1983, Ser. No. 486,706
Int. Cl.³ F16B *19/00*
U.S. Cl. 411—361 **13 Claims**

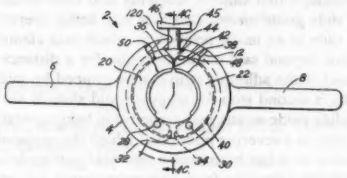


1. A two piece fastener for fastening a plurality of workpieces together with the workpieces having a thickness varying from a determinable minimum to a determinable maximum thickness, comprising a pin member having a head and a shank portion having a plurality of grooves thereon and a tubular member adapted to be swaged into locking engagement with a predetermined number of said grooves on the shank portion of the pin member by means of a tool having a swaging anvil adapted to engage the tubular member and gripping means adapted to grip a gripping portion of the shank portion, the tool being actuable to apply a relative axial tensile force between the pin member and the tubular member whereby the tubular member is swaged into said predetermined number of said grooves on the shank portion of the pin member, at least said predetermined number of said grooves being annular combination locking and breakneck grooves, each of said annular combination locking and breakneck grooves being defined by first and second radially outwardly diverging sidewalls, the juncture of said diverging sidewalls at each of the grooves including a concave radius portion interconnecting the radially inner ends of said first and second sidewalls, a selected one the grooves being located at a predetermined location proximate the outer end of the tubular member and adapted to receive the material of the tubular member as it is swaged onto the shank portion, said first and second sidewalls being angulated such as to provide a relative force between said sidewalls in said selected one of the grooves, said force being generated by the material of the tubular member as it is swaged therein, said force being greater in said selected one of the grooves than any other of said annular combination locking and breakneck grooves which receive the material of the tubular member as it is swaged onto the shank portion, wherein said relative force will be additive with the relative axial tensile force applied by the tool such that the shank portion will fracture at said selected one of the grooves, any one of said annular combination locking and breakneck grooves being capable of functioning as said selected one of the grooves when located at said predetermined location while said pulling tool exerts the relative axial tensile force on the pin member, wherein said first sidewall is inclined radially outward toward said head and said second sidewall is inclined radially outward away from said head, and the included angle defined by said first and second sidewalls decreases for each of said annular combination locking and breakneck grooves as the distance from said head increases.

4,531,872
QUICK ACTION TENSIONING NUT

Horst Warkotsh, Schulstr. 36/Post Box 1244, D-3006 Burg Wedel 3/Hann., Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,319
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127521
Int. Cl.³ F16B *37/08*
U.S. Cl. 411—433 **17 Claims**

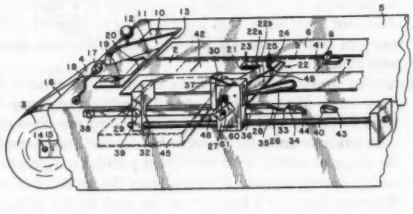


1. A quick action tensioning nut having:
(a) a body:
(b) a central passage passing through the body and having a passage axis;
(c) at least one segment axis of rotation parallel to the passage axis;
(d) at least one thread segment pivotally mounted in the body about the segment axis of rotation whereby the thread segment is moveable radially inwardly toward and outwardly from the passage axis;
(e) loading means for pre-tensioning the thread segment so that the thread segment is urged to rotate about the segment axis of rotation radially inwardly toward the passage axis; and
(f) locking means for adjustably securing the thread segment in position with respect to the passage axis, said locking means including a first annular hub in the thread segment and a second annular hub in the body, said first and second annular hubs cooperatively defining means for preventing movement of the thread segment radially outwardly from the passage axis when the first annular hub is in contact with the second annular hub.

4,531,873
APPARATUS FOR FEEDING A CUT PORTION OF ADHESIVE STRIP TO A DEVICE FOR STICKING THE BACK OF A BOOK BLOCK

Wolfgang Voges, Erlangen, Fed. Rep. of Germany, assignor to Claus Koenig KG, Erlangen, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,587
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220789
Int. Cl.³ B42B *5/04*; B65H *17/26*
U.S. Cl. 412—36 **9 Claims**



1. Apparatus for feeding a cut portion of adhesive strip for sticking the back of a book block comprising: a working table having means defining a path for longitudinally guiding an adhesive strip across said table; a holder for a roll of adhesive strip mounted at one end of said path; a severing blade ar-

ranged above said working table in the course of said path; deposit means for the portion of adhesive strip on said table; slide guide means having a slide arranged parallel to said deposit means disposed laterally along one side of said working table, said slide guide means extending from the region of said severing blade to a location beyond the end of said deposit means; a gripper supported by said slide guide means having a clamping means for gripping the end of the adhesive strip to be held in a waiting position at the cutting location of said severing blade; a first stop for stopping said slide in the course of said slide guide means, said first stop being operative to stop said slide in an initial position in which said clamping means extends beyond said cutting location for a distance such that the end of the adhesive strip can be gripped by said clamping means; a second stop for stopping said slide in the course of said slide guide means, said second stop being operative to stop said slide in a severing position at which the required length of adhesive strip has been drawn past said cutting location, said slide being releasible from said second stop for said slide to over run said second stop; a third stop for said slide mounted to stop said slide in an end position in which the leading end of the adhesive strip portion is located at the intended end of the book block to be stuck.

4,531,874

APPARATUS FOR THE ADHESIVE BINDING OF STACKS OF PAPER

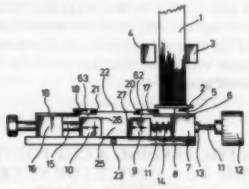
Wolfgang Voges, Erlangen, Fed. Rep. of Germany, assignor to Claus Koenig KG, Erlangen, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,586

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220694

Int. Cl.³ B42C 9/00

U.S. Cl. 412—37 **12 Claims**



1. Apparatus for adhesively binding stacks of loose pages with an adhesive strip comprising:

a form providing a trough arrangement adjustable to the back of the stack of pages to be bound, said form including a form bottom and two form walls disposed thereon;

an abutment plate disposed parallel to the form bottom and to the walls of said trough arrangement at a higher level than said form walls, said plate serving to support a loose stack of pages to be jogged into flush condition against said plate;

clamping means having an open condition to receive the loose stack of pages and a closed condition to clamp the stack of pages, said clamping means being mounted on a slide guide means which is movable parallel and normal to the plane of said form bottom, said parallel movement of said clamping means extending from the location of said abutment plate to a location above said trough arrangement and said normal movement of the back of the stack of pages clamped in said clamping means extends from said higher level of said abutment plate to said form bottom; and

means for retaining a portion of adhesive strip in a position covering said trough arrangement.

4,531,875

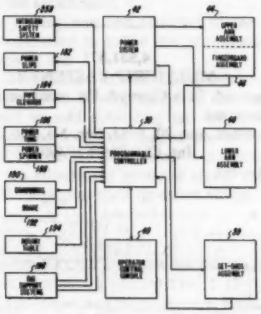
AUTOMATED PIPE EQUIPMENT SYSTEM

Roger J. Krueger, Arvada, Colo., assignor to Impro Technologies, Inc., Arvada, Colo.

Filed Aug. 17, 1982, Ser. No. 408,795

Int. Cl.³ E21B 19/14

U.S. Cl. 414—22 **11 Claims**



1. An automated system for use in facilitating the coupling or uncoupling of pipe, comprising:

first means for moving a pipe between a storage position and a coupling position, said first means including transport means for receiving a lower portion of the pipe and being movable to place the lower portion of the pipe in a predetermined position, said transport means including:

cup means for receiving at least portion of the pipe,

a lower carriage movable in a first direction,

an upper carriage supported on said lower carriage and movable in a second direction, and

sloping track means supported on said upper carriage for use in moving said cup means therealong in upwardly and downwardly directions; second means for use in coupling or uncoupling pipe;

transducer means operatively associated with said first means and said second means for sensing whether said first means has gripped the pipe and also sensing whether said second means has gripped the pipe; and

control means in operative association with said first means, said second means, and said transducer means for automatically controlling said first means and moving uncoupled pipe to a predetermined storage position, said control means responding to said transducer means in conjunction with the controlling of movement of the pipe using said first means.

4,531,876

STORAGE SILO FOR DIFFICULTLY FLOWING BULK MATERIAL

Hans Gessler, Aalen, Fed. Rep. of Germany, assignor to Schwäbische Hüttenwerke GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 410,947

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135295

Int. Cl.³ B65G 65/42

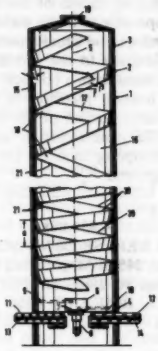
U.S. Cl. 414—325 **18 Claims**

1. Storage silo adapted to difficultly flowing bulk material to be discharged at the bottom of the silo comprising

a substantially cylindrical container having an unobstructed opening near the top; and

a deceleration baffle disposed in the container, which baffle is attached to the container wall and runs inclined along said wall like a helix section relative to the center axis of the silo toward the silo bottom and where the baffle sections extend along a helical path over a central angle of at

least about 360 degrees and are substantially continuously connected for steadying the flow of the bulk material as the level of the bulk material contacts the baffle such that the distribution and flow of the material in the silo is controlled during outflow through a discharge opening



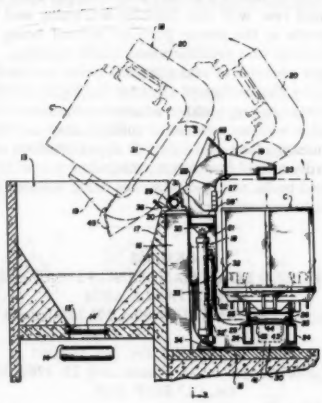
and the bulk material is directed to the center of the silo by the baffle surface wherein at least some baffle sections which are vertically aligned along the silo wall are increasingly spaced with respect to teach other as the distance increases from the bottom of said container.

4,531,877

RAIL CAR DUMPING SYSTEM AND METHOD

Curtis E. Carroll, 9957 Tracy Rd., Atoka, Tenn. 38004

Filed Jan. 31, 1983, Ser. No. 462,476
Int. Cl.³ B65G 67/00
U.S. Cl. 414—372 **4 Claims**



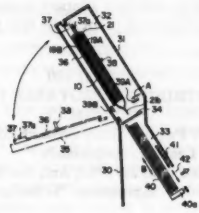
1. A rail car emptying apparatus comprising a substantially C-shaped rail car gripping jaw means including upper horizontal jaws and lower horizontal jaws which are movable vertically toward and away from the upper horizontal jaws, the upper and lower horizontal jaws havng vertical telescopically engaging portions adapted for positioning near one side of a rail car being emptied by the apparatus, a fixed horizontal axis pivot disposed at an elevation near and below the upper horizontal jaws and near the top of a rail car being emptied when the latter is upright, a bracket on said pivot and turning therewith and being fixed to the upper horizontal jaws, first comparatively short stroke power cylinder means connected between the telescopically engaging vertical portions of said upper and lower horizontal jaws and being operable to lift the lower jaws and a rail car thereon vertically through a distance whereby the top of such car will engage the upper horizontal jaws firmly, and second comparatively long stroke power cylinder means connected between the pivot bracket and a fixed anchor of the aparatus and being operable independently of and after the vertical car lifting operation of the first power cylinder means to rotate the entire C-shaped rail car gripping jaw means around the axis of said pivot to a rail car emptying position where a car held in the gripping jaw means is substantially inverted at an elevation near and above said pivot.

4,531,878

DAYLIGHT FILM LOADING METHOD AND APPARATUS

Kaoru Tamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 19, 1983, Ser. No. 524,639
Claims priority, application Japan, Aug. 20, 1982, 57-144200
Int. Cl.³ B65G 65/00
U.S. Cl. 414—412 **10 Claims**



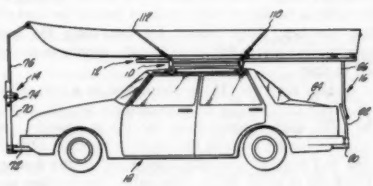
1. A method of loading films in a daylight environment by holding a film package, which comprises a light-tight envelope and a stack of unexposed light-sensitive films contained therein, in a vertical position in a loading chamber shielded from light, opening a lower end of said light-tight envelope while at least the films are prevented from falling, and then releasing said films with said light-tight envelope being held, thereby allowing said films to fall from said light-tight envelope by weight thereof, wherein the improvement comprises moving a film receiving case for receiving said films to the vicinity of the lower end of said film package before said films are allowed to fall, moving down said film receiving case after said films fall, thereby completely separating said films from said light-tight envelope, and thereafter closing a shutter between said light-tight envelope and said films to shield said films from light.

4,531,879

BOAT LOADING AND CARRYING DEVICE

Isadore Horowitz, P.O. Box 5916, Shreveport, La. 71135

Filed Aug. 30, 1983, Ser. No. 527,697
Int. Cl.³ B60R 9/04
U.S. Cl. 414—462 **2 Claims**



1. A device for loading and carrying a boat or similar object

centrally on the roof of a conventional automobile, the device comprising

(a) a base having means for attaching said base securely and centrally to the roof of an automobile;

(b) rack means, for holding the boat, pivotally attached to said base, said rack means pivotable between a first position inclined downwardly relative to the roof of the automobile and a second position substantially parallel with the roof of the automobile;

(c) means attached to the automobile for pulling the boat onto said rack means;

(d) guard means attached to the automobile for preventing the rack means from hitting and possibly damaging the automobile when said rack means is in its first position, said guard means comprising a guard attached to the automobile and extending upwardly above the trunk or hood of the automobile to provide a stop against which said rack will rest when said rack is in its first position; and

(e) rack support means pivotally attached to said guard for supporting said rack means in its second position, said rack support means pivotable between a first position in which said rack support means extends upwardly and supports said rack means in its second position, and a second position in which said rack support means is down such that said rack means can pivot to its first position.

4,531,880

SILAGE DISTRIBUTOR MOVABLE BY MEANS OF A VEHICLE

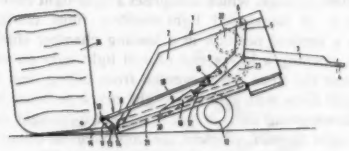
Gerardus H. F. Paques, Balk, Netherlands, assignor to Multinorm B.V., Lemmer, Netherlands

Filed Jun. 29, 1983, Ser. No. 509,194

Claims priority, application Netherlands, Jul. 2, 1982, 8202680

Int. Cl.³ B60P *1/16*

U.S. Cl. 414—473 **2 Claims**



1. A silage block distributor movable by means of a vehicle, provided on one side with a drawbar containing a coupling member, which drawbar is connected to a truck on wheels resting on the ground and comprising a loading platform, said truck further being provided at the side opposite the drawbar with a loading member for receiving a silage block and placing the same on the loading platform, which loading member is tiltable from a position approximately right-angled to the loading platform to a position which is approximately an extension of the loading platform, said distributor is further provided with silage loosening means for loosening the silage block, conveyor means for transporting the silage block to the silage loosening means, fodder supply means for laterally supplying the loosened silage from the distributor to the feeding location of the cattle to be fed, as well as drive means for operating the loading member, drive means for operating the loosening means and drive means for operating the supply means, characterized in that:

the loading member (15) is connected to a pair of linkages (7), each comprising an intermediate bar (5) and a draw link (8); each intermediate bar (5) is provided with an angle oriented toward the loading member (15) and has one end portion pivotally connected to the frame of the truck (2) at pivot (6) and the other end portion pivotally connected at pivot (9) to one end of a draw link (8) and at pivot (16) to a piston (17) which is part of a hydraulically operable cylinder-and-piston assembly (18), the cylinder (19) of which is pivotally connected to the frame of the truck (2); each of the draw links (8) is connected at the end thereof distal from pivot (9) with a lever (11) which is operably connected at its other end to loading member (15); the intermediate bars (5) are connected to the drawbar (3), such that by means of the linkages (7) and said hydraulically operable cylinder-and-piston assembly, the back of the truck can be simultaneously displaced downwardly approximately to the ground while the loading member (15) is tilted from a position approximately right-angled to the loading platform to a position which is approximately an extension of the loading platform and vice versa while maintaining a substantially constant height of the coupling member (4) of the drawbar (3) relative to the ground.

4,531,881

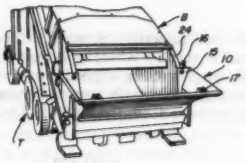
ADAPTER FOR REFUSE COMPACTING VEHICLE

Martin J. Stempniak, 245 S. Maple Ave., Oak Park, Ill. 60302

Filed Sep. 30, 1983, Ser. No. 537,864

Int. Cl.³ B65F *3/02*; B65G *67/04*

U.S. Cl. 414—572 **6 Claims**



1. A leaf funnel for a refuse removal vehicle which has a generally rectangular opening of predetermined width yielding access to a refuse compacting chamber,

said funnel including a unitary metal hopper body having an inclined rear wall and flanking sidewalls, said rear and sidewalls at the lower portions thereof being sized to conform to said predetermined width opening,

the upper portions of said sidewalls being outwardly flared whereby the bucket of a loader having a width greater than said opening width is adapted to load leaves into said chamber without substantial spillage, and

flange means along said sidewall upper portions extending inwardly of said funnel and constituting partial front walls for said body, said flange means being adapted to be secured to said vehicle.

4,531,882

STABILIZED LOAD HANDLING VEHICLE WITH ORIENTABLE ARM

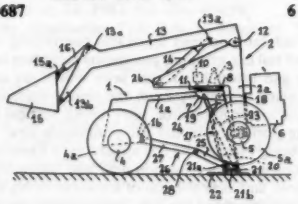
Gilbert Pierre, "Les Biches" Douvaine, FR 74140 Saint Cergues, France

Filed Jul. 22, 1983, Ser. No. 516,063

Claims priority, application France, Jul. 23, 1982, 82 13223

Int. Cl.³ E02F *9/08*

U.S. Cl. 414—687 **6 Claims**



1. A self-stabilizing load lifting and handling machine of the

type having a narrow chassis having two articulated chassis elements respectively carrying two longitudinally spaced pairs of ground engaging wheels which are transversely spaced by a gauge which is wide as compared with the width of the chassis, comprising:

a first chassis element carrying a first axle supporting a first pair of said wheels, the first chassis element including a horizontal chassis arm portion spaced above the ground and having a free end spaced longitudinally away from the first axle, and said free end supporting a vertically oriented chassis articulation pivot;

a second chassis element overlying said free end of the first chassis element and articulated thereto about said pivot, and including a leg portion extending downwardly beyond said free end of the first chassis element and carrying a second axle supporting the second pair of wheels;

motor means on the chassis including means operative to rotate the second chassis element about the pivot relative to the first chassis element;

a load handling arm horizontally pivoted at one end to said second chassis element and carrying work tool means at its other end;

a chassis supporting inverted T-shaped prop having a central member with an upper end horizontally hinged to said free end of the horizontal chassis arm portion, the prop being operative to pivot between a retracted position in which its lower end is raised to lie beneath said horizontal chassis arm portion and a work position in which it extends upright with its other end against the ground, the inverted T-shaped prop including transverse branches disposed normal to said central member and extending at least to the width of the gauge of the wheels;

jack means extending from said horizontal chassis arm portion to said prop and selectively actuatable by a drive means to move the prop between said retracted and work positions; and

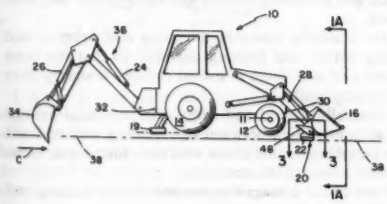
foldable linkage means coupled between the first chassis element and the inverted T-shaped prop and being operative to counteract rotational torque tending to twist the prop when the second chassis element is rotated about the first.

4,531,883

BACKHOE STABILIZER SYSTEM

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Filed Dec. 8, 1982, Ser. No. 448,023
Int. Cl.³ E02F 3/00
U.S. Cl. 414—722 **12 Claims**



1. A stabilization system adapted for use with tractor equipment having a digging bucket disposed from one end and a loader/bucket disposed from a second end opposite said first end, said system comprising:

a stabilization spike;

a friction surface;

a bracket adapted to be fixedly attached to said loader bucket; and,

means attached to said bracket for

(i) disposing and maintaining said friction surface in either of a first friction surface attitude in which said surface is disposed in a horizontal, downward attitude below said loader bucket and a second friction surface attitude in which said surface is disposed above the bottom of said loader bucket with said surface oriented at an angle of at least 90° relative to that at which it is oriented in said first friction surface attitude,

(ii) disposing and maintaining said spike in either of a first spike attitude in which said spike extends generally vertically downwardly below the bottom of said bucket and a second spike attitude in which said spike is disposed above the bottom of said bucket with said spike oriented at an angle of at least 90° relative to that at which it is oriented in said first spike attitude, and

(iii) permitting each of said surface and said spike independently to rotate about a horizontal axis between said first attitude and said second attidude thereof,

whereby each of said friction surface and said spike when disposed in said first attitude thereof supports and prevents movement of said equipment in respect to digging action of said digging bucket, and in said second attitude thereof permits said loader bucket to be used without interference therefrom.

7. A stabilization system adapted for use with tractor equipment having a digging bucket disposed from a first end and a loader-bucket/arm unit disposed from a second end opposite said first end, said stabilization system comprising:

a friction surface and a stabilization spike connected in a unit and disposed in opposite directions;

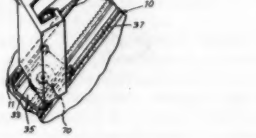
a bracket adapted for attaching said friction surface/spike unit to said loader-bucket/arm unit, said friction surface/spike unit includeing a mounting plate and said bracket comprises two parallel plates, each bracket plate having a slot to receive opposite edges of said unit mounting plate, whereby said bucket is arranged to dispose either said surface in a horizontal, downward attitude below the level of said unit or said spike in a downward vertical attitude extending below the level of said unit, and either said spike or said friction surface when so extended and disposed, supports and prevents movement of said equipment in response to digging action of said bucket.

4,531,884

AUTOMATED MACHINE

Richard H. Russell, Box 312, Farmington, Conn. 06032

Filed Nov. 15, 1982, Ser. No. 441,641
Int. Cl.³ B66C 1/00
U.S. Cl. 414—729 **6 Claims**



1. A production tool comprising a support, a housing mounted on said support for selective rotation in either a clockwise or counterclockwise direction about a vertical axis through the center thereof; said housing having an upper portion; an articulated load carrying means supported by said housing including an upper member having a bearing supported inner end and an outer end, said bearing supported inner end of said upper member being carried by a bearing means on said housing so that said upper member can be selectively angularly driven to oscillate in a vertical plane; a second element having an inner bearing end and an outer end at the opposite ends of its longitudinal axis that extends from said

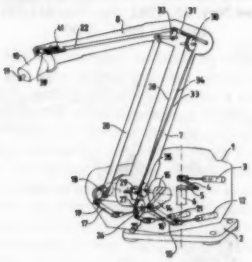
inner end to said outer end thereof; bearing means for carrying the inner end of said second element at the outer end of said upper member; said second element being adapted to be selectively driven to swing in either direction through an arc in a vertical plane; an angulating member and a twisting member; a support means at said outer end of the second element for carrying said angulated and twisting members, said support means including bearing means for supporting the angulating member on a bearing having an axis whereby the angulating member can selectively be angularly driven through an arc in a vertical plane and said support means also including bearing means having an axis to permit selective driving rotation of the twisting member through 360° in a second plane that is perpendicular to said plane of movement of the angulating means; a pair of load engaging means at least one of which is adapted to be opened and closed relative to the other; said load engaging means being operatively supported on said twisting member; a drive for said tool consisting of a single electric motor drive mounted within said housing; a plurality of electrically operated clutch means and brake means in said housing; said clutch and brake means cooperating with gear means, and drive shafts for operating said housing, said upper member, said second element, said angulating and said twisting and said load engaging means; said motor providing power and said clutch and brake means all of which are enclosed within said housing being operative for cooperating therewith to open and close said load engaging means and drive said articulated means all independently one with respect to the other, to perform a coordinated useful series of motions; and control means for activating said clutch and brake means for selectively moving and then inactivating the drives for positioning said housing and operating said articulated load carrying means.

4,531,885

DEVICE FOR ROBOT MANIPULATOR

Ole Molaug, Byrne, Norway, assignor to Graco Robotics, Inc., Livonia, Mich.

PCT No. PCT/US82/01353, § 371 Date Jan. 10, 1983, § 102(e) Date Jan. 10, 1983
PCT Filed Sep. 24, 1982, Ser. No. 464,518
Claims priority, application Norway, Oct. 5, 1981, 813365
Int. Cl.³ B66C *1/00*
U.S. Cl. 414—735 **10 Claims**



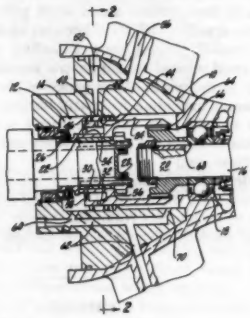
10. A device for robot manipulators of the kind which have a multiple articulated manipulator arm (**7, 8, 10**) rotatably mounted in a swivelling base (**1**) and wherein a front portion (**10**) of the manipulator arm (**7, 8, 10**) is rotatably connected, via a three-point connection, to a portion (**8**) of the manipulator arm (**7, 8, 10**) situated behind so that the front portion (**10**) of the manipulator arm (**7, 8, 10**) can be turned, up to a certain angle, in all possible directions in relation to the portion (**8**) of the manipulator arm (**7, 8, 10**) situated behind, by means of two longitudinally displaceable, substantially parallel rods (**22, 23**), one end of each of said rods which is pivotally secured to the front portion (**10**) of the manipulator arm (**7, 8, 10**) and form two of the points in said three-point connection, the third point consisting of a universal joint connection (**9**) and wherein the manipulator arm (**7, 8, 10**) with a tool holder (**11**) is controlled by a system with hydraulic servo-cylinders (**46**), characterized in that all the servo-cylinders (**46**) are placed in the base (**1**) of the robot manipulator and that mechanical power transmission means are disposed between the tool holder (**11**) or each of the parts of the manipulator arm (**7, 8, 10**) respectively and the associated servo-cylinder (**46**), and that linear movements of the servo-cylinders (**46**) are converted into a substantially proportional rotary movement over the whole working range of the servo-cylinders (**46**) by the means of a crank arm (**54**), one end of which is rigidly connected to a rotatable shaft (**55**) and the other end of which is pivotally connected to the one end of a link (**53**) to the other end of which is pivotally connected to a guide (**50**) which runs in a fixed guide (**52**) and which is connected to the piston rod (**47**) of the servo-cylinder (**46**).

4,531,886

DRUM PUMP

Casimir Rogo, 29528 N. Seaway Ct., Mt. Clemens, Mich. 48045, and Aldo Urbani, 7000 Stockport, Lambertville, Mich. 48144

Filed Apr. 4, 1983, Ser. No. 482,029
Int. Cl.³ F16D *3/46*; F01D *1/18*
U.S. Cl. 415—90 **8 Claims**



1. A pump comprising:

a housing having a cylindrical wall defining an interior cylindrical chamber,

a cylindrical drum having an outer cylindrical surface, an inner surface and an annular channel formed on said inner surface and extending radially outwardly from said inner surface,

means for coaxially rotatably mounting said drum to said housing within said housing chamber so that the outer periphery of said drum is spaced radially inwardly from said housing wall,

a pair of axially spaced and substantially parallel annular fluid seals extending between said housing wall and said outer periphery of said drum, said seals forming an annular outlet chamber therebetween,

at least one outlet passageway formed in said housing and open to said outlet chamber,

at least one connecting passageway formed in said drum and extending between said channel and said outlet chamber,

means for supplying a fluid to said drum channel, and

means for rotatably driving said drum.

4,531,887

CONTINUOUS BLADE MULTI-STAGE PUMP

Philip H. Klepesch, 5859 Sagebrush Rd., La Jolla, Calif. 92037

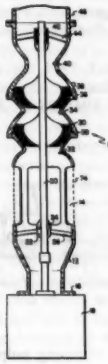
Filed Jun. 6, 1983, Ser. No. 501,362
Int. Cl.³ F01D *5/06*
U.S. Cl. 415—90 **9 Claims**

7. An axial flow pump comprising:

a housing defining a generally spheroid rotor chamber having an axis;

an inlet at one end of said chamber and an outlet at the other end of said chamber; and

a first impeller rotatably mounted in said chamber and comprising a plurality of concentrically mounted radially



spaced shells of a truncated generally oblate spheroid configuration mounted for rotation about the axis thereof defining fluid flow channels spaced therebetween having a generally spheroid configuration with an inlet at one end and an outlet at the other end, said shells curving inward toward the axis thereof at the outlet for directing fluid inward toward the axis thereof.

4,531,888

WATER TURBINE

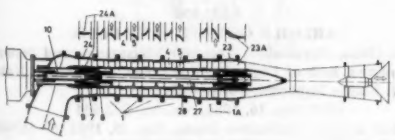
Benno Bucheit, Zellerstrasse 16, A-9063 Maria Saal, Austria

Continuation-in-part of Ser. No. 110,248, Jan. 7, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,561

Claims priority, application Austria, Jan. 18, 1979, 384/79

Int. Cl.³ F01D *1/04, 17/12*

U.S. Cl. 415—148 **10 Claims**



1. An axial type water turbine comprising a pair of bearing support frames spaced apart along an axis of the water turbine with the bearing support frames extending around the axis, at least two interchangeable stages secured together in line in the direction of the turbine axis between said support frames, each of said at least two interchangeable stages comprises two prefabricated structural parts including an external axially extending tubular stator housing and an axially extending tubular runner hub located within and spaced radially inwardly from said stator housing, each said stator housing having a flange formed monolithically with said housing at each of the opposite ends thereof spaced apart in the axial direction and guide vanes formed monolithically thereon and extending radially inwardly therefrom, each said runner hub being coaxial with the axis of the water turbine, means for transmitting torque through each of said runner hubs, and runner vanes formed monolithically with extending radially outwardly from said runner hub, a central tie rod extending coaxially with the turbine axis through said at least two stages and said tie rod is threaded at each of its ends with the length thereof corresponding to the number of stages in the turbine and said tie rod does not center the running parts of the stages and is separate from said means for transmitting torque.

4,531,889

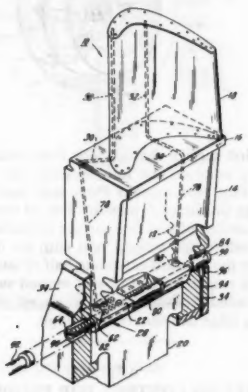
COOLING SYSTEM UTILIZING FLOW RESISTANCE DEVICES TO DISTRIBUTE LIQUID COOLANT TO AIR FOIL DISTRIBUTION CHANNELS

Clayton M. Grondahl, Clifton Park, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Continuation of Ser. No. 176,600, Aug. 8, 1980, abandoned. This application Feb. 1, 1983, Ser. No. 462,768

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—96 R **5 Claims**



1. A liquid coolant supply for use in a rotating element wherein rotation of the rotating element produces substantial outward directed radial acceleration, comprising:

a plurality of coolant channels in said rotating element;

a plurality of flow-resistance devices, one per coolant channel;

a single means for feeding a cooling liquid to a radially outward portion of all of said flow-resistance devices;

a path in each of said flow-resistance devices effective for permitting said fluid to flow radially inward to an exit opening;

means for conveying said fluid from said exit opening to its respective coolant channel;

means for permitting a pressure head of said cooling liquid to be formed upstream of said single means for feeding a cooling liquid;

each of said plurality of flow-resistance devices including means for metering a flow therethrough proportional to a function of a said pressure head applied thereto whereby a flow through each of said flow resistance devices to its respective coolant channel is related to said head and a flow resistance thereof and is substantially independent of a flow through others of said flow resistance devices; and

wherein said path includes a respective strainer located between said radially outward portion and each of said flow resistance devices.

4,531,890

CENTRIFUGAL FAN IMPELLER

Walter S. Stokes, 2336 Lu Field Rd., Dallas, Tex. 75229

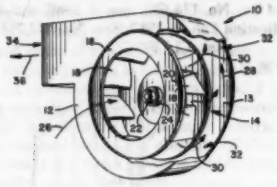
Filed Jan. 24, 1983, Ser. No. 460,249

Int. Cl.³ F04D *29/30*

U.S. Cl. 416—187 **2 Claims**

1. A centrifugal fan comprising an impeller and means for rotating said impeller, said impeller further comprising a plu-

rality of circumferentially spaced apart, backward inclined blades, said blades being cambered radially inward so as to provide substantially laminar flow on the low pressure side of said blades when said impeller is rotated, said blades further comprising a leading edge and a trailing edge, and being disposed relative to the direction of rotation in such manner that the chord extending between the leading and trailing edges of each of said blades is disposed at an angle of less than about 40° relative to the tangential direction at the midpoint of said chord when said impeller is rotated, said blade further comprising a first surface that extends from said leading edge to said trailing edge on the low pressure side of said blade, a second surface that extends from said leading edge to said trailing edge on the high pressure side of said blade, with the maximum camber of said first surface occurring in the forward extending half of said surface, and with the line of mean camber between the forward extending half of said first surface and the forward extending half of said second surface being itself cambered radially inward from the chord extending between said leading edge and said trailing edge.

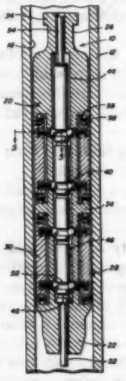


4,531,891

FLUID BYPASS CONTROL FOR PRODUCING WELL PLUNGER ASSEMBLY

Otis C. Coles, III, P.O. Box 5197, Abilene, Tex. 79608

Filed Jan. 11, 1984, Ser. No. 570,609
Int. Cl.³ F04B 47/12
U.S. Cl. 417—59 13 Claims



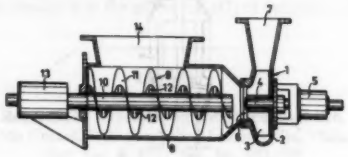
1. In a plunger assembly adapted to be reciprocated within a tube string for lifting fluid during upward travel from a bottom hole position to which the plunger assembly descends, the plunger assembly having an elongated mandrel, pad means mounted on the mandrel for radial displacement relative thereto, and spring means for biasing the pad means radially outward into wiping contact with the tube string, the improvement comprising collapsing means continuously biasing the pad means radially inward against the bias of the spring means to establish a fluid bypass space about the plunger assembly within the tube string, and means for automatically rendering the collapsing means ineffective to establish the fluid bypass space only during said upward travel of the plunger assembly from the bottom hole position.

4,531,892

APPARATUS FOR PUMPING OF PULP

Lars E. Näsman, Alnö, and Alf I. Lindström, Sundsbruk, both of Sweden, assignors to Sunds Defibrator Aktiebolag, Sundsvall, Sweden

Filed Feb. 7, 1984, Ser. No. 577,827
Claims priority, application Sweden, Mar. 14, 1983, 8301360
Int. Cl.³ F04B 23/14; F10B 3/00
U.S. Cl. 417—205 4 Claims



1. An apparatus for pumping pulp of high concentration, comprising:

a cenrifugal pump having a rotary impeller positioned between an inlet and an outlet of said pump,

a screw conveyor mounted for rotation independently of said pump and including a screw arranged to advance pulp toward a discharge end of said screw conveyor,

said discharge end being arranged in communication with said inlet of said pump,

said screw comprising a partially open thread to permit a partial recirculation of the pulp,

said screw having a transport capacity exceeding that of said pump, so that said partial recirculation of pulp is induced,

the cross-sectional area of said discharge end of said screw conveyor being substantially greater than said pump inlet,

means for rotating said pump impeller, and

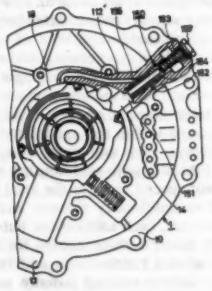
means for rotating said screw at a slower rate than said pump impeller.

4,531,893

VARIABLE OUTPUT VANE PUMP

Tomio Okoh, Toyamaken; Tomoaki Matsumoto, and Noboru Hirokawa, both of Toyama, all of Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Sep. 16, 1983, Ser. No. 532,834
Claims priority, application Japan, Sep. 28, 1982, 57-167618
Int. Cl.³ F04B 49/00
U.S. Cl. 417—220 13 Claims



1. In a variable output vane pump including a pump housing

having a circular bore; a rotor supported rotatably within said housing; a plurality of vanes fitted in the outer circumference of said rotor, said vanes being displaceable radially into and out of said rotor; a ring supported by a pivot portion, said pivot portion connecting the circular bore of said housing to the outer circumference of said ring and enclosing said rotor and said vanes; and inlet and outlet ports formed in said housing, at least one pressure chamber for pivoting said ring being formed between the circular bore of said housing and the outer circumference of said ring by means of at least one seal pin fitted in an axial groove formed in the outer circumference of said ring and opening into the circular bore of said housing, said ring being urged by the action of a spring fitted in said housing in a direction opposite to that of the pressure built up by said pressure chamber, said direction being such that the axis of said ring is displaced from the axis of rotation of said rotor;

the improvement comprising an elastic member fitted in the bottom of said axial groove formed in the outer circumference of said ring and opening into the circular bore of said housing, said elastic member urging said seal pin both toward the circular bore of said housing and at the same time toward one of the side walls of said axial groove, the urging direction of said elastic member and a tangential line, on which said seal pin is tangential to the circular bore of said housing, being at an acute angle with respect to each other.

4,531,894

SEALED TYPE MOTOR COMPRESSOR

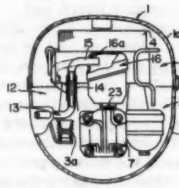
Hideki Kawai; Hidetoshi Nishihara; Seishi Nakaoka, and Koushi Hamada, all of Fujisawa, Japan, assignors to Matsushita Reika Co., Ltd., Osaka, Japan

Continuation of Ser. No. 407,905, Aug. 13, 1982, abandoned. This application Apr. 27, 1984, Ser. No. 604,403

Claims priority, application Japan, Aug. 25, 1981, 56-132850; Oct. 26, 1981, 56-159183[U]; Mar. 18, 1982, 57-44270; Mar. 18, 1982, 57-44271

Int. Cl.³ F04B *35/00, 37/00;* F16L *21/00*

U.S. Cl. 417—312 **2 Claims**



1. A sealed type motor compressor comprising a motor section and a compressor section resiliently supported within a sealed enclosure, a suction pipe extending through a side wall of said sealed enclosure, a suction muffler disposed on a side wall of said compressor section, and an insert pipe inserted into and extending into the interior of said sealed enclosure with a slight clearance between it and an inlet port formed in a side wall of said suction muffler, and a closely coiled spring in the form of a cylinder secured to said suction pipe and said insert pipe for interconnecting them, said closely coiled spring having a torsional moment which provides a biasing force causing said insert pipe to abut against said inlet port, said suction muffler including a cup-shaped body formed of a synthetic resin and divided into at least upper and lower sections, a closure member covering an opening of said body and a partition plate mounted between said body and said closure member, said cup-shaped body being open at its top surface and formed at its bottom surface with an aperture, through which a communication pipe is fitted into a suction port formed in said compressor section to securely support said cup-shaped body, said partition plate being formed with a through hole, having a position which is offset from an extension of said communication pipe, said inlet port being provided on the side of said closure member.

4,531,895

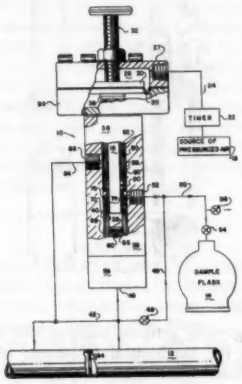
GAS SAMPLING PUMP

Ted E. Zeck, Snyder, Tex., assignor to Y-Z Industries, Inc., Snyder, Tex.

Filed Oct. 15, 1984, Ser. No. 660,963

Int. Cl.³ F04B *39/10*

U.S. Cl. 417—401 **8 Claims**



1. A gas sampling pump comprising:

a. a body,

b. a cylindrical pump bore in the body having

i. an inlet at an inlet end, and

ii. an outlet at an outlet end,

c. a cylindrical plunger having a snug fit in the bore,

d. motor means for reciprocating the plunger attached thereto,

e. a circular inlet valve seat coaxial with the bore at the inlet,

f. a flat circular disc inlet valve having a snug fit in the bore on the valve seat, coaxially therewith,

g. a circular outlet valve seat encircling the plunger at the outlet,

h. an annular outlet valve encircling the plunger,

i. seal means on the annular valve for making a sliding gas tight seal to the plunger and to the valve seat,

j. the size of the elements such that the plunger and the disc valve substantially fill the bore from the inlet valve seat to the outlet valve seat.

4,531,896

FLUID PUMP

Harry L. Spears, 6307 Glenhill, Spring, Tex. 77389

Continuation-in-part of Ser. No. 487,287, Apr. 21, 1983, Pat. No. 4,504,199. This application Mar. 19, 1984, Ser. No. 591,021

Int. Cl.³ F04B *39/08, 21/04*

U.S. Cl. 417—456 **23 Claims**

1. A fluid pump, comprising:

an elongate housing having upper and lower ends;

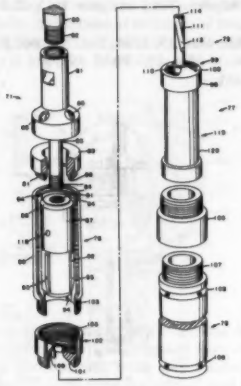
a first valve disposed in the lower end of the housing;

a travelling valve actuator member, having upper and lower ends, disposed in the upper end of the housing and slideably mounted for longitudinal movement with respect to the housing;

a rotatable travelling valve disposed between the first valve and the travelling valve actuator member, the travelling valve having upper and lower ends and a sealing surface associated with each end;

a piston for compressing fluid disposed between the first valve and travelling valve; and

means for rotating the travelling valve about its longitudinal axis, said means for rotating being associated with the



travelling valve actuator member and travelling valve, whereby the longitudinal movement of the travelling valve actuator member causes rotational movement of the travelling valve.

4,531,897

PISTON PUMP WITH A ROTATING PISTON

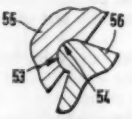
Franz Orlita, Waldstrasse 33, D-6305 Buseck-Altenbuseck, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,174

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300847

Int. Cl.³ F04B *9/04*

U.S. Cl. 417—500 **27 Claims**



1. A piston pump, comprising: a rotatable piston which is movable back and forth in a cylindrical bore; a rotating crank with which the piston is operatively coupled, the piston axis and the axis of rotation of the crank intersecting one another at an angle; and an annular piston rolling surface which is arranged on the piston and cooperates with an annular crank rolling surface arranged on the crank; wherein the axes of the annular rolling surfaces are inclined relative to one another and the rolling surfaces are urged against one another at a point of contact by forces which occur during the discharge stroke, which contact point upon rotation of the crank moves by rolling along the annular rolling surfaces; wherein the piston and crank are connected by connecting means for causing forces which occur during the suction stroke to be transmitted from the crank to the piston; wherein the piston axis has a constant angle with respect to the crank axis of rotation; and wherein the piston rolling surface is a cone-shaped surface and the crank rolling surface is a flat surface, the cone-shaped piston rolling surface engaging the crank rolling surface along a line of contact which includes the point of contact.

4,531,898

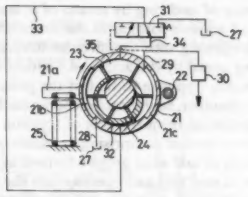
CONTROL SYSTEM FOR A VANE TYPE VARIABLE DISPLACEMENT PUMP

Yasufumi Ideta, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 13, 1983, Ser. No. 561,032

Int. Cl.³ F04C *2/00, 15/04*

U.S. Cl. 418—26 **8 Claims**



1. A vane type variable displacement pump comprising:

a cam ring having a protrusion extending radially outward from said cam ring and mounted to a support member of said pump at said protrusion with a pin so as to permit pivotal movement of said cam ring about said pin, said cam ring having a suction port to draw in hydraulic fluid and a delivery port to discharge said hydraulic fluid,

a rotor provided radially inward of said cam ring in an eccentric relationship with said cam ring wherein the eccentricity is varied by the pivotal movement of said cam ring,

a plurality of vanes each provided radially slidably through said rotor to come in abutting engagement with an inner surface of said cam ring during rotation, each pair of said vanes defining a chamber together with said cam ring and said rotor, each said chamber communicating with said suction and delivery ports when each said chamber passes by said suction and delivery ports during rotation,

a positioning means for rotating said cam ring in a direction to make said eccentricity larger, and

a control means connected to a first chamber which has passed by said suction port and to a second chamber which has passed by said delivery port, said control means being adapted to allow the communication between said first and second chambers when the pressure at the delivery port is lower than a preset pressure and to block the communication between said first and second chambers when the pressure at the delivery port is higher than said preset pressure, wherein blocking the communication of said first and second chambers creates a force that opposes the positioning means.

4,531,899

POSITIVE DISPLACEMENT ROTARY GAS COMPRESSOR PUMP

Rainer Sudbeck, Wassenberg; Hans Baumgartner, Viersen, and Manfred Brandstadter, Dusseldorf, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co KG, Neuss, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,153

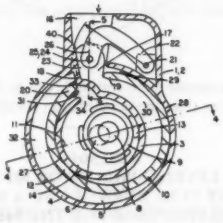
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231754

Int. Cl.³ F04C *17/02*

U.S. Cl. 418—59 **2 Claims**

1. A positive displacement rotary compressor pump for a compressible gas comprising a housing including concentric inner and outer cylinder walls defining an annular chamber therebetween, and a radial bridging wall portion joining said walls together, a ring piston in said chamber defining suction and compression chambers with said walls, an eccentric crankshaft stub drivingly connected to said ring piston to impart rotational drive to said ring piston, a crank arm pivotably

connected to said housing and to said ring piston to control the movement of the ring piston to be along a reciprocal open path at the connection with the crank arm, the distance between the pivotal connections of said crank arm being greater than the eccentricity of the crankshaft stub so that the ring piston produces a pumping action on the compressible gas in the chambers, said ring piston including a ring wall having a longitudinal opening accommodating said bridging wall portion, said ring wall having spaced ends at said longitudinal opening constituting inlet and outlet ends, said outlet end being at the outlet of a compression chamber and undergoing displacement between said outer cylinder wall and said inner cylinder wall during compression of gas in the latter said compression chamber, said bridging wall portion being shaped to conform in part to the envelope surface described by said outlet end of the ring



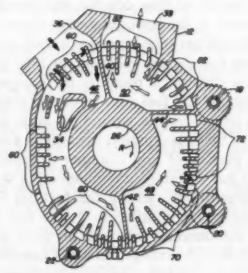
wall in the movement of said ring wall between the outer cylinder wall and the inner cylinder wall during compression such that said wall portion is proximate said oulet end leaving a minimal gap therewith during a first portion of the movement of said ring wall causing compression of said gas in said chamber prior to discharge of the gas from said chamber whereafter said outlet end moves away from said wall portion so that the compressed gas can be discharged under pressure from said compression chamber, a radially inwards projecting extension on said outlet end of the ring wall of said piston, said inner wall of said housing having a transfer end defining a transfer port with said bridging wall portion for discharge of compressed medium from the pump, said extension coming into proximity with said transfer end to form a minimal gap therewith during compression of the medium.

4,531,900

ROTARY ENGINE COOLING SYSTEM

Charles Jones, Hillsdale; Richard M. Gigon, Oradell, and Edward J. Blum, Wayne, all of N.J., assignors to John Deere Technologies International, Inc., Moline, Ill.

Filed Jun. 7, 1984, Ser. No. 618,099
Int. Cl.[3] F01C *1/22, 21/06*
U.S. Cl. 418—61 A **1 Claim**



1. In a rotary combustion engine with a rotor rotatable within a trochoidal cavity in a housing having an intake port region, an exhaust port region, an expansion region, a compression region, a top-dead-center region, and a liquid cooling circuit formed by series-connected circumferentially-spaced sets of axially extending housing passages forming a multi-pass series flow path, the improvement wherein the cooling circuit comprises:

a coolant inlet for receiving coolant in the vicinity of the intake port;

a coolant outlet positioned in the compression region between the inlet and the top-dead-center region; and

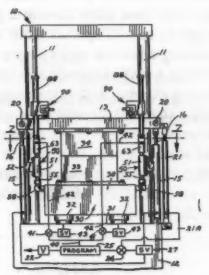
passage means in the housing for directing coolant flow axially and generally in a direction opposite to the direction of rotor rotation from the coolant inlet to the coolant outlet, said passage means having a top-dead-center portion downstream of other portions in the intake port, exhaust port and expansion regions of the housing, coolant flowing in the top-dead-center portion having a pressure which is reduced by said coolant having first flowed through the said other portions, said reduced coolant pressure lowering a saturation temperature of the coolant and enhancing cooling by nucleate boiling in the top-dead-center portion.

4,531,901

CROSSHEAD AND BOLSTER SPACING CONTROL FOR SERVO CONTROLLED PRESS

Dennis H. Andersen, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Division of Ser. No. 366,149, Apr. 7, 1982, Pat. No. 4,457,072.
This application May 10, 1984, Ser. No. 608,716
Int. Cl.[3] B30B *11/00*
U.S. Cl. 425—150 **4 Claims**

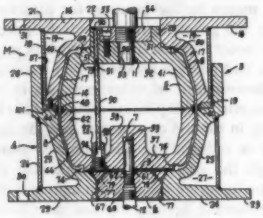


1. In combination with a press having a base, a bolster movable relative to said base, a plurality of columns, and a crosshead mounted on said columns for movement toward and away from said bolster, the improvement comprising a transducer assembly for controlling the positioning of the crosshead and bolster relative to each other until said crosshead is moved along said columns a preselected amount away from said base, and then providing a signal indicating the position of said bolster relative to said base, including a housing mounted in a fixed position relative to said base, a first slidable member extending in a first direction from said housing, a second slidable member extending from said housing in a direction away from said base, stop means to prevent said second member from sliding away from said base more than a selected amount, means on said bolster engaging said first member and causing sliding movement thereof as the bolster moves relative to the base, means on said crosshead to engage said second member and move it away from the stop means when said crosshead is moved to a preselected position adjacent said base, means to sense the relative position between said first and second members, and bias means urging said first and second members away from each other.

4,531,902
APPARATUS FOR MAKING IMPROVED TIRE CURING BLADDERS

Terrence M. Stuhldreher, Wadsworth, Ohio, and Rene L. Rockarts, Northport, Ala., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 14, 1983, Ser. No. 551,545
Int. Cl.[3] B29C *1/00*
U.S. Cl. 425—408 6 Claims



1. In a press for shaping and vulcanizing tire curing bladders, a mold comprising a generally cylindrical shaped core having a top surface, a bottom surface, a unitary peripheral external wall, said wall having a generally smooth surface; an upper mold section and a lower mold section wherein during shaping and vulcanizing said tire curing bladder said upper mold section and said lower mold section are positioned to generally envelop said core thereby forming a cavity between said mold and said core in a shape of said bladder; a central base plate located in said lower mold section below said bottom face of said core and mounted to move axially relative to said lower mold section, said base plate having a grooved upper surface which is adjacent to and spaced from said bottom surface of said core defining a bottom mold cavity in which a diaphragm of rubber having a wall thickness less than that of said bladder is formed during shaping and vulcanizing a tire curing bladder; a guide means attached to said base plate where said guide means positions said core relative to said plate when said mold is closed; and a valve means to supply pressurized gas between said diaphragm and core to separate the core from the diaphragm and to expand the bladder radially as the core is removed from the bladder.

4,531,903
APPARATUS FOR FORMING PARTICLES INTO SHAPED ARTICLES

David J. Frey, and Keith E. Wier, both of Boulder, Colo., assignors to SXD Refractories, Inc., Boulder, Colo.

Division of Ser. No. 401,422, Jul. 23, 1982, Pat. No. 4,456,574.
This application Jun. 19, 1984, Ser. No. 622,143
Int. Cl.[3] B28B *1/08*; B29G *1/00*
U.S. Cl. 425—429 5 Claims

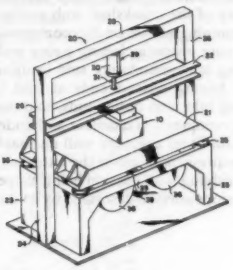
1. Apparatus for producing compacted molded shapes from particulate materials, the apparatus comprising:

a mold defining a closed opening therein and having at least one movable wall defining the opening;

a movable support table adapted to support the mold with at least one movable wall of the mold parallel with the support table;

oscillating means connected to the support table to oscillate the support table in the direction perpendicular to the movable mold wall with sufficient magnitude to throw the mold from the support table; and

damper means carried on the apparatus and positioned to bear against the mold and toward the support table with a force less than that required to maintain the mold in contact with the support table during oscillation of the support table, whereby during oscillation of the support table the mold will temporarily leave the table and be urged back into contact with the table by the damper

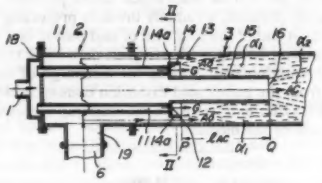


means to generate acceleration levels at the mold substantially greater than the acceleration levels of the table.

4,531,904
LOW NO_x LEVEL COMBUSTION METHOD IN A RADIANT TUBE BURNER AND A BURNING APPARATUS USED FOR THE METHOD

Kuniaki Sato; Shinichiro Muto, both of Chiba; Fumiya Yanagishima, and Yuji Shimoyama, both of Ichihara, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 274,421, Jun. 17, 1981, abandoned.
This application Nov. 1, 1984, Ser. No. 667,080
Claims priority, application Japan, Jun. 27, 1980, 55-87475
Int. Cl.[3] F23M *3/04*
U.S. Cl. 431—10 2 Claims



1. A low NOx level combustion method in a radiant tube burner, the method comprising flowing an inner air flow in an inner air flow conduit connected to a source of combustion air, and arranged centrally of an annular chamber in the radiant tube, the chamber being provided with a base portion connected to the inner air flow conduit and having a rim portion integrally formed at the peripheral edge thereof, said chamber forming in the radiant tube an annular fuel space bounded by the rim portion and the central inner air flow conduit, flowing a fuel gas flow through a plurality of fuel-gas conduits connected at a first end to a fuel gas source and arranged in a circle in the radiant tube so as to surround the inner air flow conduit, said plurality of fuel-gas conduits opening at a second end open into the base portion of said chamber to form fuel-gas openings, said fuel gas openings communicating with the annular fuel space therethrough, jetting the fuel-gas flow into a primary combustion region adjacent to the rim portion of said chamber and surrounding the inner air flow conduit through said fuel-gas openings arranged in said chamber at the second end of said fuel-gas conduits, the inner air flow conduit extending forwardly and downstream of said chamber in the flowing direction of the fuel gas and along a central axis of the radiant tube, jetting the inner air flow into a secondary combustion region through an open end of the inner air flow conduit, and jetting an outer air flow in communication with the combus-

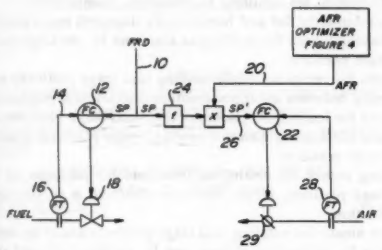
tion air source and surrounding the fuel gas flow into the primary combustion region through a passage formed between the radiant tube and the rim portion of said chamber, the fuel gas being primarily burnt by the outer air flow and then secondarily burnt by the inner air flow, and further comprising jetting the fuel gas flow by means of 3~6 fuel gas openings arranged in said chamber, carrying out a primary combustion of the fuel gas by controlling the ratio of the amount of the inner air flow to the total amount of introduced air to 35–80%, and limiting the momentum ratio of the fuel gas flow to the outer air flow to not lower than 0.40, and further carrying out a secondary combustion of the primarily burnt fuel gas by setting the length of the inner air flow conduit such that the secondary combustion is carried out at a time substantially later than the time of the primary combustion, whereby a uniform and smooth two stage combustion is carried out.

4,531,905

OPTIMIZING COMBUSTION AIR FLOW

Charles W. Ross, Lansdale, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 15, 1983, Ser. No. 532,344
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—12 **16 Claims**



1. A method for controlling the air/fuel ratio of a fossil fired furnace to optimize the output of the furnace under varying operating conditions, comprising the steps of:

measuring over a period of change in said air/fuel ratio the change in a first variable of the exhaust gases representative of the amount of combustibles present in said gases,

calculating from said first variable the absolute value of the change in heat losses over said period due to the change in the amount of combustibles in said gases,

measuring during said period the change in a second variable of the exhaust gases which is representative of the amount of excess air in said gases, and

calculating from said second variable the absolute value of the change in heat losses over said period due to the change in the amount of excess air in said gases,

automatically modifying the air/fuel ratio by increasing the air/fuel ratio when the absolute value of the change in heat loss due to excess air is less than that due to combustibles and decreasing the air/fuel ratio when the change in absolute value of the heat loss due to excess air is greater than that due to combustibles, to tend to maintain said calculated absolute value of the change in heat losses due to change in said first variable over said period equal to the calculated absolute value of the change in heat losses due to changes in said second variable over said period, thereby optimizing the furnace output.

4,531,906

LIGHTER CASE HAVING WINDSHIELD

Yukihiro Mizukami, 17-12, Ikegami 5-chome, Ohta-ku, Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,763
Claims priority, application Japan, Aug. 19, 1983, 58-128059[U]; Rep. of Korea, Jan. 17, 1984, 84-349[U]
Int. Cl.³ F23Q *25/00*
U.S. Cl. 431—146 **3 Claims**

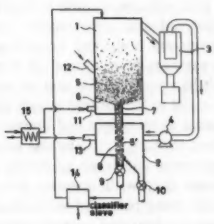
1. A lighter case comprising a hollow case member adapted to receive therein a lighter and including a top opening for inserting and removing said lighter therethrough and at least one side opening; and a windshield member adapted to be received in said case member and to receive therein at least a part of said lighter, said windshield member including an open side portion and an open bottom, said windshield member including a top portion which is at least partly opened, and said windshield member being mounted in said case member for slidable movement in the longitudinal direction with respect to said case member.

4,531,907

FLUIDIZED BED COMBUSTOR

Yoshio Kawamura, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,249
Claims priority, application Japan, Oct. 7, 1983, 58-187985
Int. Cl.³ F23D *19/00*
U.S. Cl. 431—170 **14 Claims**



1. A fluidized bed combustion system, comprising:

a fluidized bed combustor;

first outlet means operatively connected to said fluidized bed combustor for discharging slagging ash and fluidized solids from said fluidized bed combustor;

second outlet means operatively connected to said fluidized bed combustor for discharging combustion gas from said fluidized bed combustor;

a filtering dust collector having an inlet operatively connected to said second outlet means of said fluidized bed combustor for receiving said combustion gas discharged from said fluidized bed combustor, and an outlet for discharging filtered combustion gas; and

perforate means, operatively connected to said first outlet means of said fluidized bed combustor for receiving said slagging ash and fluidized solids discharged from said fluidized bed combustor, disposed interiorly of said filtering dust collector such that said perforate means and said discharged slagging ash and fluidized solids serve as a filtering medium for said combustion gas from said fluidized bed combustor as said combustion gas flows through said filtering dust collector and said perforate means from said filtering dust collector inlet to said filtering duct collector outlet.

4,531,908

CERAMIC BURNER HEAD

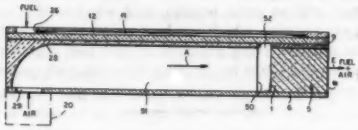
Siegfried Förster, Alsdorf; Stefan R. Schindler, and Hartmut Keller, both of Selb, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich and Rosenthal Technik AG, Selb, both of, Fed. Rep. of Germany

Continuation of Ser. No. 250,768, Apr. 3, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 398,797

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014059

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—215 **1 Claim**



1. A ceramic burner head formed with a burner mouth and comprising:

a unitary fluid-permeable porous ceramic body of rectangular parallelepipedal configuration terminating at said mouth and formed with mutually parallel alternating slit-like flow passages for fuel and air whereby fuel from the fuel passages penetrates through porous walls formed between said passages by said body to mix with said air, and also formed with impermeable outer walls peripherally flanking said body and hermetically sealed thereto, said flow passages being closed off from said mouth, each of said slit-like passages for said air having a height substantially equal to that of said mouth and a width which is small relative to its height and opening at said mouth;

a ceramic heat exchange rectangular parallelepipedal member spaced from said body to define a flow-distributing compartment therewith opening into said air passages, said member being provided with slit-shaped passages for said air opening into said compartment and effecting heat exchange between said air and a heat exchange fluid traversing further slit-shaped passages in said member alternating with the slit-shaped passages of said air, each of said slit-shaped passages having a height substantially equal to that of said body and a width which is small relative to its height; and

a pair of ceramic plates which extend the full length of said burner head and enclose both said body and said member, said plates forming said walls, one of said plates being formed with an inlet for said fuel and an opposing plate being provided with an inlet for said air, said passages extending perpendicular to said one of said plates and said opposing plate, said plates delimiting said compartment directly.

4,531,909

HANDLING SYSTEM FOR IC DEVICE

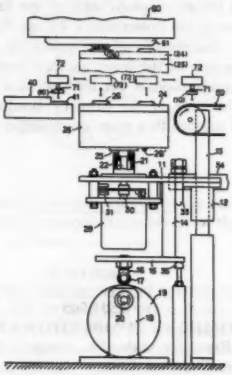
Osamu Takeshita, Hikone, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 4, 1983, Ser. No. 549,450

Claims priority, application Japan, Nov. 29, 1982, 57-181402[U]

Int. Cl.³ F27B *9/40*; F27D *19/00*

U.S. Cl. 432—37 **13 Claims**



1. A system for handling IC packages, comprising:

a substantially flat and horizontally disposed stage platform having means for holding at least one IC package on said state platform;

means for reciprocatingly moving said stage platform vertically between an upper position and a lower position;

means for loading IC packages onto said stage platform into said IC holding means when said stage platform is at said lower position;

testing means for testing at least one IC package on said stage platform when the stage platform is in the upper position;

drive means for rotating said stage platform about its center;

means for unloading at least one IC package off said stage platform after the stage platform is rotated and after the IC package has been tested; and

control means for sequentially controlling the means for loading and the means for unloading the IC package, and the means for reciprocatingly moving and means for rotating the stage platform.

4,531,910

DOWN DRAFT KILN

Paul H. Geil, 1522 Loma Dr., Hermosa Beach, Calif. 90254

Continuation of Ser. No. 901,721, May 1, 1978, abandoned, and a continuation of Ser. No. 717,994, Aug. 26, 1976, abandoned, and a continuation-in-part of Ser. No. 571,506, Apr. 25, 1975, abandoned. This application Jun. 8, 1979, Ser. No. 46,623

Int. Cl.³ F27B *9/00*

U.S. Cl. 432—120 **2 Claims**

1. A gas fired kiln for transferring heat by convection and radiation to objects placed therein, comprising:

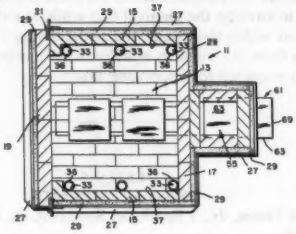
a chamber defining structure having a horizontal planar floor, two vertical planar side walls and vertical front and rear walls and an arched crown;

a plurality of independent and symmetrically spaced burner openings in said floor disposed exclusively along and immediately adjacent the interior planar surfaces of said side walls between said front and rear walls, the lower ends of which burner openings are in direct communication with the external atmosphere;

at least one flue opening in said structure communicating with the interior of said chamber at approximately the level of said floor;

a vertical flue disposed externally of said chamber defining structure and communicating at its lower extremity with said flue opening;

and burner means including vertically oriented natural draft burners disposed in said burner openings and extending upwardly to below the interior surface of said floor for



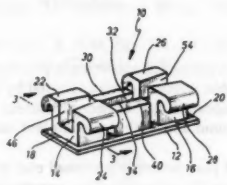
burning fuel at relatively high velocity entirely within said chamber along non-deflected vertical flame paths immediately adjacent and parallel to said interior surfaces of said side walls; wherein the cross sections of said burner openings are circular, and wherein at least a portion of the walls of each of said burner openings is curved inwardly progressing in the direction of said interior surface of said floor and each defining in conjunction with an associated one of said burners a partial constriction thereat exhibiting a venturi effect.

4,531,911

COMBINATION SINGLE/TWIN EDGEWISE ORTHODONTIC BRACKET

Thomas D. Creekmore, 1620 Fountainview, Houston, Tex. 77057

Filed Dec. 5, 1983, Ser. No. 557,877
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—8 **29 Claims**



1. A combination single/twin orthodontic bracket for edgewise orthodontic therapy, said orthodontic bracket comprising:

(a) bracket body means adapted to be secured in immovable relation with a tooth and forming mesial and distal sides and occlusal and gingival portions;

(b) occlusal tie wing means extending from said occlusal portion of said bracket body means;

(c) gingival tie wing means extending from said gingival portion of said bracket body means, said occlusal and gingival tie wing means defining a specified tie wing length;

(d) an intermediate bracket section being positioned at least partially between said occlusal and gingival tie wing means, said intermediate bracket section defining spaced parallel planar archwire engaging surfaces according to edgewise orthodontic therapy which form a precision edgewise archwire slot of less length than said specified tie wing length and adapted to receive an edgewise archwire of rectangular configuration in precision interfitting force transmitting relation such that forces are imparted by said archwire to said bracket body means according to edgewise orthodontic therapy; and

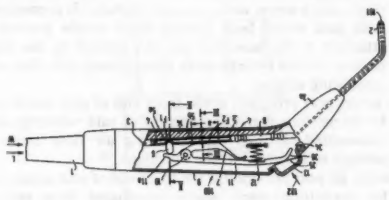
(e) said bracket body means defining archwire relief surface means being greater in occlusal gingival width as compared to said archwire slot and extending from each end of said archwire slot of said intermediate section to the respective mesial and distal sides of said bracket body means and being located at least partially between said occlusal and gingival tie wing means, whereby force transmission from the archwire to said bracket body means for tipping and torquing takes place at said edgewise archwire slot of said intermediate bracket section, interbracket width of the archwire extends between the intermediate bracket sections of adjacent brackets and said tie wing means are selectively ligated for rotational control.

4,531,912

DENTAL SPRAY HAND PIECE

Werner Schuss, Heppenheim, and Walter Weber, Lorsch, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,566
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208666
Int. Cl.³ A61C *17/02*
U.S. Cl. 433—80 **16 Claims**

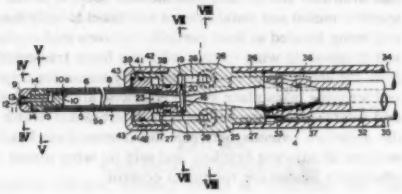


1. In a dental spray hand piece comprising an agent line leading through a housing of the hand piece and terminating in a spray nozzle, valve means in the housing of the hand piece for controlling the flow of an agent in said line, said valve means being actuated by means of a purchase, said agent line including means for preventing dripping when the valve means closes flow in said line, said means for preventing dripping creating a suction on the agent in the line to draw the agent back from the end of said nozzle, the improvements comprising the means for preventing dripping including a portion of the agent line being a hose section of elastic material extending through the valve means toward the nozzle, said hose section having a cross-section greater than the cross-section of the flow passing through the valve means when in an open state, a rocker arm being mounted in the housing of the dental hand piece for pivotal movement, means biasing the rocker arm to a first position with a portion of the rocker arm causing a pinching-off of the hose to form the valve means to block flow in said agent line, said rocker arm having one end being engaged by said purchase, and a thrust piece engaging the hose section between the valve means and the nozzle and being coupled directly to the rocker arm by means of a bearing arrangement so that depression of the purchase pivots the rocker arm from the first position to a position allowing flow of an agent in the line and moves the thrust piece to partially deform the hose section to the cross-section of the flow through said valve means.

4,531,913
DENTAL SYRINGE

Mitsukuni Taguchi, Zushi, Japan, assignor to Takara Nakajima Co., Ltd., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,099
Claims priority, application Japan, May 26, 1983, 58-78141; May 26, 1983, 58-78142
Int. Cl.³ A61C 17/02
U.S. Cl. 433—80 18 Claims



1. A dental syringe, comprising:

a syringe body provided therein with an air feed passage coupled to a compressed air source through an air feed tube, and a water feed passage coupled to a warm water source through a water feed tube;

means for generating a whirling air flow by being supplied with compressed air through said air feed passage;

a nozzle portion provided therein with a whirling air flow transmission passage for permitting the whirling air flow generated by said whirling air flow generating means to be transmitted therethrough toward the fore end of said syringe, and a warm water passage disposed in communication with said water feed passage, said nozzle portion being attached at the base end portion thereof to the fore end portion of said syringe body through said whirling air flow generating means;

an air jet port provided at the front end of said nozzle portion for permitting the outer portion of said whirling air flow transmitted through said whirling air flow transmission passage to be jetted to the outside;

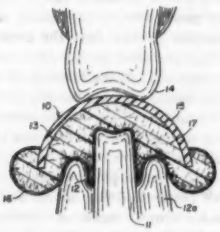
a water jet port provided at the front end of said nozzle portion for permitting warm water introduced from said warm water passage to be jetted to the outside; and

a cylindrical shank portion mounted at the rear end of said syringe body.

4,531,914
DENTAL DEVICE AND METHOD FOR GINGIVAL RETRACTION AND CONDITIONING

Ronald P. Spinello, 523 Post Ave., Westbury, N.Y. 11590

Continuation-in-part of Ser. No. 287,375, Jul. 27, 1981, abandoned. This application Aug. 18, 1983, Ser. No. 524,336
Int. Cl.³ A61C 5/14
U.S. Cl. 433—136 27 Claims

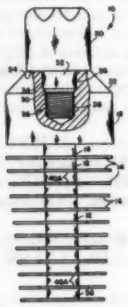


1. In a method of gingival retraction and treatment, the steps of preparing a tooth for crowning by grinding the side walls into truncated conical configuration with the base disposed in the sub-gingival area not in excess of the depth of the sulcus to define a gingival trough between the ground-down walls of the tooth and the gingival flap of surrounding tissue, placing on the tooth a body of coherent flowable and moldable material having a substantial thickness at least approximating the length of the exposed portion of the tooth and having hydrosorbent characteristics at least at its surface, applying pressure on the body axially with respect to the tooth to cause the material to flow down the conical sides of the tooth and over the gingival tissue to envelop the gingival flap while absorbing liquid matter from within the trough and withdrawing the molded body axially from the tooth to establish a substantially dry gingival trough prepared for impression taking.

4,531,915
DENTAL IMPLANT

O. Hilt Tatum, Jr., 1 Beach Dr. Southeast, St. Petersburg, Fla. 33701

Continuation of Ser. No. 407,942, Aug. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 303,577, Aug. 14, 1981, abandoned. This application Sep. 14, 1984, Ser. No. 650,573
Int. Cl.³ A61C 8/00
U.S. Cl. 433—173 23 Claims



1. A dental implant for suporting a prosthesis, said implant being implantable within a cavity vacated by the extraction of a tooth and suported and anchored therein by ingrowth of bony tissue around and within the implant, said implant comprising:

an elongated post having a proximal end and a distal end,

support means for supporting the prosthesis and connected to said post proximal end,

a multiplicity of fins extending outwardingly from said post between said proximal and distal ends thereof,

said fins being in spaced and parallel relation to each other along the length of said post, thereby to provide multiple axially extending areas between said fins for ingrowth of bony tissue therebetween as well as therearound to mount said implant firmly in said dental cavity,

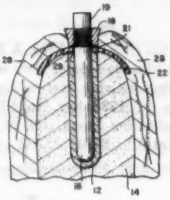
each said fin having a disc-like thin and flat configuration and a width substantially greater than that of said post to provide a substantial surface area for and between said fins for reception of bony tissue ingrowth thereover, thereby to withstand vertical loadings on said implant in use without loosening thereof, and

at least one said fin having a non-circular configuration in a plane perpendicular to said post, thereby with ingrowth of the bony tissue to preclude rotation of said implant in said dental cavity.

4,531,916
DENTAL IMPLANT WITH EXPANDED PTFE GINGIVAL INTERFACE

Todd V. Scantlebury; Jeanne B. Ambruster; Carl W. Bolton, all of Flagstaff; Stephen E. Campbell, Cave Creek, and La Thaggar Green, III, Flagstaff, all of Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jul. 8, 1983, Ser. No. 511,995
Int. Cl.[3] A61C *8/00*
U.S. Cl. 433—173 24 Claims

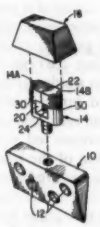


1. A dental implant device comprising:
a. a root structure made of a biocompatible, mechanically suitable prosthetic material;
b. a cervical segment connected to and projecting above said root structure, said cervical segment made of a biocompatible, nonporous material and extending above the gingival epithelial tissue and having smooth surfaces, said root structure and said cervical segment forming a member; and
c. a gingival interface comprising a porous polytetrafluoroethylene member having a pair of spaced surfaces that define a wall thickness for the polytetrafluoroethylene member with both spaced surfaces extending outwardly from the periphery of the root structure and the cervical segment to permit tissue ingrowth into each of said spaced surfaces.

4,531,917
DETACHABLE POST FOR AN OSSEOUS IMPLANT

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024, and Leo Hoffman, 15 Woodmere Blvd., Woodmere, N.Y. 11598

Filed Apr. 2, 1984, Ser. No. 595,984
Int. Cl.[3] A61C *8/00*
U.S. Cl. 433—176 14 Claims

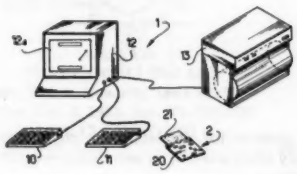


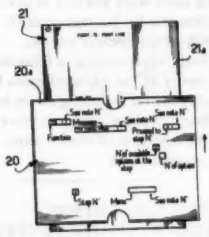
1. An oral implant for supporting an artificial tooth structure comprising:
an implant portion adapted to be fitted in an opening in a bone in the vicinity of the occlusal plane, which bone has been exposed by an incision in the covering fibromucosal tissue;
a neck portion extending from a part of the implant portion toward the occlusal plane;
a post portion having an interior cavity with side walls being adapted to fit over an end of said neck portion directed toward the occlusal plane; and
wedging means for causing said neck portion to spread apart such that said neck portion comes into engagement with the interior cavity of said post portion so said post is releasably locked to said neck.

4,531,918
APPARATUS FOR THE INTERPRETATION OF VARIOUS STEPS OF AN INTERACTIVE COMPUTER PROGRAM AND A METHOD OF USING SUCH APPARATUS

Bernard Coquil, Chatou, and Alain Monta, La Baule, both of France, assignors to Compagnie Francaise d'Etudes et de Construction "Technip" , France

Filed Mar. 6, 1984, Ser. No. 586,718
Claims priority, application France, Mar. 11, 1983, 83 04078
Int. Cl.[3] G09B *19/00*
U.S. Cl. 434—118 7 Claims

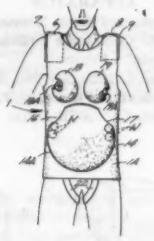




1. Apparatus for replacing a handbook of directions for use of an interactive program of a computer permitting a user to accomplish at least one technical operation, such as, a graph, or the like, during a conversational dialogue between said user and a computer device under the control of an interactive program including a sequence of steps at least some of which offer an option between at least two possibilities of execution of said operation, said apparatus comprising
two elements slidable with respect to each other, a first of said elements constituting a support on which are indicated the instructions for the control of said program relating to the accomplishment of the operation and including the functions of the operation that the program must execute, the numbers of the steps for sequentially accomplishing the operations, the number of available options at each step number, messages indicating actions for introducing data in said computer device, and indications relative to each message, said functions, numbers of steps, number of available options, and messages being grouped independently at different parts on said first element, and a second of said elements having a number of viewing windows equal to the number of groups formed on said first of said elements, one window being associated with each group element when said first and second of said elements are moved sequentially with respect to each other at positions each corresponding to each step whose

number is viewed through the associated window, so that at each step the user can view through the windows all the instructions for accomplishing said technical operation.

4,531,919
GARMENT FOR SIMULATING THE EFFECTS OF PREGNANCY ON THE HUMAN BODY
Linda M. Ware, 3760 Onyx St., Eugene, Oreg. 97405
Filed Jul. 12, 1984, Ser. No. 630,272
Int. Cl.³ G09B 9/00; A41D 1/00
U.S. Cl. 434—262 **7 Claims**



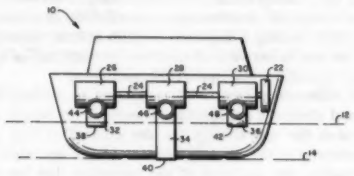
1. A garment for simulating the physiological effects of pregnancy when worn by an ambulatory wearer, said garment comprising,

a main body portion for substantially overlying frontal placement on the torso of the wearer, retention means for holding the main body portion in place on a torso including strap elements for passage over the wearer's shoulders and the back of the wearer's torso,

a weighted body representing a fetus located adjacent the lower extremity of the garment main body portion, and

said main body portion including an enclosure confining said weighted body in place, said enclosure having an opening to permit the insertion of one or more weights to contribute to a true simulation.

4,531,920
TRANSVERSE WATERJET PROPULSION WITH AUXILIARY INLETS AND IMPELLERS
John G. Stricker, 871 Highland Ave., Annapolis, Md. 21403
Filed Jul. 22, 1983, Ser. No. 516,216
Int. Cl.³ B63H 11/08
U.S. Cl. 440—47 **6 Claims**



1. A waterjet propulsion system for a marine vehicle intended to propel said vehicle at variable speeds, where at high speeds said vehicle planes and has an associated high speed waterline and where at low speeds said vehicle does not plane and has an associated low speed waterline, said low speed waterline being higher relative to said vehicle than said high speed waterline, comprising:

at least one engine;

at least one pump drive shaft;

a transmission means connecting said engine to said pump drive shaft;

at least one primary pump and nozzle device driven by said pump drive shaft;

at least one lower inlet located below the high speed water line of the vehicle;

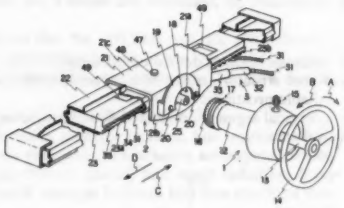
ducting connecting the lower inlet to the primary pump;

at least one auxiliary pump and nozzle device driven by said pump drive shaft;

at least one upper inlet located below the low water line of the vehicle but above the high speed water line; and

ducting connecting the upper inlet only to the auxiliary pump.

4,531,921
STEERING SYSTEM FOR A BOAT
Makoto Teraura, and Masanao Baba, both of Takarazuka, Japan, assignors to Nippon Cable System, Inc., Hyogo, Japan
Filed Jan. 27, 1984, Ser. No. 574,770
Claims priority, application Japan, Jul. 25, 1983, 58-136355
Int. Cl.³ B63H 25/02
U.S. Cl. 440—53 **9 Claims**



1. A rack-and-pinion steering system for controlling at least one push-pull rudder control cable of a boat, comprising:

(a) a longitudinally extending flat tubular rack casing provided with a large opening proximate a central lower portion thereof;

(b) at least one inner cable guiding portion formed along at least one side wall of said rack casing, said inner cable guiding portion extending in the longitudinal direction of said rack casing and having a small opening provided in said rack casing side wall proximate a central portion thereof and facing said longitudinal direction;

(c) a rack slidably carried in said rack casing;

(d) a pinion disposed at said large opening of said rack casing, said pinion being meshedly engaged with said rack such that rotation of said pinion causes said rack to move longitudinally;

(e) at least one inner cable of a push-pull control cable, one end of said inner cable being engaged with an end of said rack, with a front portion of said inner cable extending from said end being carried between said inner cable guiding portion and a side surface of said rack, a continuing portion of said inner cable extending through said small opening of said rack casing, and the other end of said inner cable being connected with a rudder means or another steering system of the boat;

(f) a rigid cable guide having at least one front end portion thereof jointed to said small opening of said rack casing and having at least one guide groove extending from said front end portion to a rear end portion of said rigid cable guide, said rigid cable guide and its guide groove being smoothly curved between said front and rear end portions for slidably guiding said inner cable in a slanting direction with respect to said longitudinal direction of said inner cable guiding portion of said rack casing, a front end of said guide groove being co-axial with said small opening of said rack casing and said rigid cable guide being attachable to said rack casing;

(g) at least one outer casing of said push-pull control cable for slidably guiding said inner cable to said rudder means

or to said other steering system, one end of said outer casing being connected to said rear end portion of said cable guide with an end portion of said outer casing proximate said end extending along a direction of said rear end of said guide groove;

(h) a bracket for attaching said cable guide to said rack casing;

(i) a steering shaft having one end portion securely connected with said pinion, a steering wheel being securely attached to the other end portion of said steering shaft;

(j) a housing rotatably supporting said steering shaft; and

(k) joining means for joining said attached rack casing and cable guide with said housing.

4,531,922

SAILBOARD AND PROCESS FOR ITS PRODUCTION

Udo Schütz, Bahnhofstrasse 25, D-5418 Selters, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,017

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246578

Int. Cl.³ B63B *5/24*

U.S. Cl. 441—74 **5 Claims**

1. Sailboard made of a synthetic resin with an outer skin and with a foam core, as well as with a stringer forming a longitudinal center wall, characterized by the following features:

(a) the outer skin (2) of a thermoplastic synthetic resin consists of an upper half shell and a lower half shell (3 and 4, respectively), formed by vacuum deep drawing;

(b) the half shells (3, 4) are welded together all around the equatorial line (8);

(c) the stringer (5) is integrally molded in doublewall fashion to the upper and/or lower one of the half shells (3, 4) with a profile (6) that is U-shaped over at least the largest portion of its length, and is welded, at the base (7) of its U profile (6), to the respectively opposed half shell (3 or 4);

(d) the profile cavity or profile cavities of the stringer (5; 5*a*, 5*b*) is or are filled with glued-in-place hard foam elements (12) and sealed by profiled strips (14);

(e) the foam core (11) consists of a foam material injected into the cavity defined by the welded-together half shells (3, 4).

4,531,923

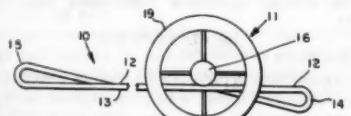
MAGNETIC SPINNER

Raymond J. Lohr, 5043 Sterrettania Rd., Erie, Pa. 16506

Filed Sep. 30, 1982, Ser. No. 430,768

Int. Cl.³ A63H *33/26*

U.S. Cl. 446—138 **10 Claims**



1. A toy comprising:

a ferrous wand adapted to be manually grasped and manipulated,

a spinner adapted to rotate along the wand,

the wand comprising:

a flat elongated ferrous member having a first planar side and a second planar side, a first edge and a second edge, the first side and the second side being adapted to provide a runway for the passage of the spinner,

said wand having end means joining said first and second sides whereby said spinner is adapted to traverse a continuous cycle therearound and to move without stopping into another cycle,

said wand being devoid of any manipulating handle other than the wand itself so that in order to rotate the spinner uninterruptedly through a full cycle, the user must release and then regain his grasp on the wand,

the spinner comprising:

an axle,

a first wheel and a second wheel one mounted adjacent each end of the axle,

the axle being a cylindrical permanent magnet,

said wheels being spaced apart a distance substantially equal to the width of said wand,

the first and second wheels being adapted to rotate in respective planes parallel to each other, adjacent to said edges and generally perpendicular to said sides when the spinner is rotated along the wand.

4,531,924

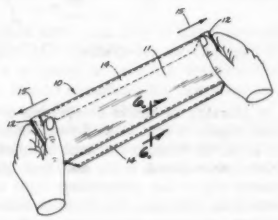
TURKEY CALLING AID

Ralph D. Samson, Rte. 2, Runnells, Iowa 50237

Filed Jun. 3, 1983, Ser. No. 500,890

Int. Cl.³ A63H *5/00*

U.S. Cl. 446—213 **10 Claims**



1. An apparatus for calling wild turkeys comprising:

a strip of flexible cloth which is longer than wide and having a first end and a second end;

reinforcement means at each end of said strip for holding said ends straight with the strip extended widthwise at said ends;

the flexibility of said strip being such that at least a central portion of said strip sags under its own weight when the strip is suspended between said ends by holding said ends relatively close to each other, said strip having an area large enough to cause an audible sound simulating that of a game bird flapping its wings when the strip is repeatedly flexed and stretched in ambient air;

flap means having a flexibility like that of said strip attached to each of the side edges of said strip for muffling the sound of said apparatus when said strip of cloth is rapidly stretched, said flap means being free of the extending effect of said reinforcement means.

8. A method of calling wild turkeys using a single strip of flexible cloth which is longer than wide, said strip having a first end and a second end, the flexibility of said strip being such that at least a central portion of said strip sags under its own weight when the strip is suspended between said ends by holding said ends relatively close to each other, said method comprising:

carrying said strip into the woods at or near dawn to an area where wild turkeys are considered likely to roost;

grasping one end only of said strip with one hand so as to hold the strip extended widthwise;

grasping the other end only of said strip with the other hand so as to hold the strip extended widthwise;

moving said hands towards each other while so holding said ends whereby the strip is allowed to sag therebetween in a generally untwisted condition; and

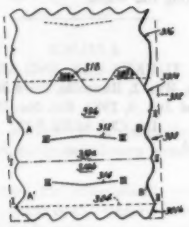
rapidly jerking said hands apart while still so holding said strip to stretch the strip tight, while at the same time preventing said strip from striking anything other than ambient air, thereby producing an audible sound simulating the sound of a wild turkey flapping its wings.

4,531,925

COMPACT MANUFACTURING SYSTEM FOR FORMING SOFT GOODS, MAINLY TOYS

Claude R. M. Moreau, 85-06 60th Ave., Elmhurst, N.Y. 11373

Division of Ser. No. 223,423, Jan. 8, 1981, Pat. No. 4,358,907.
This application Jul. 6, 1982, Ser. No. 395,092
The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.
Int. Cl.³ A63H *3/02*
U.S. Cl. 446—369 **3 Claims**



1. A plurality of blanks comprising at least two mutually discrete blanks, a first of said two blanks being a one-piece fabric blank for forming the main body of a soft figure toy of the three-dimensional type, said first blank having curved peripheral edges and comprising right side, front and rear body-forming portions, four right limb-forming portions, left side, front and rear body-forming portions and four left limb-forming portions, all of which portions are integral with each other, the right and left groups of portions being substantially identical mirror images with respect to an imaginary median line forming a central axis of said first blank, a second of said blanks being a one-piece fabric blank having curved peripheral edges for forming at least a portion of a soft toy of the three-dimensional type, said plurality of blanks being die-cut from a single length of fabric, said first and second blanks having, in addition to said curved peripheral edges, respective curved edge portions of substantial length which mate with each other in a jig-saw puzzle relationship whereby said length of fabric may be used with a maximum of economy in cutting and utilization of fabric material in forming a succession of blanks each of which is foldable and seamable to form a portion of a three-dimensional toy.

4,531,926

ADJUSTABLE PITCH SPROCKET

James B. Reeves, Jr., 1315 Whitman Dr., Glen Burnie, Md. 21061

Filed Jul. 11, 1983, Ser. No. 512,540
Int. Cl.³ F16H *9/02*
U.S. Cl. 474—49 **3 Claims**

1. An adjustable sprocket, to be used in a chain drive, to compensate for chain and tooth wear by selective adjustment to move tooth portions of the sprocket radially outward, comprising:

an adaptor disc having means for mounting the disc for rotation about a sprocket axis;

a plurality of separate individual sprocket teeth;

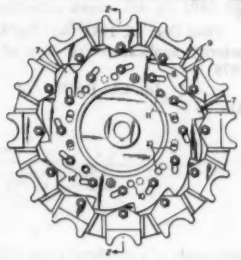
means mounting each of said teeth on said adaptor disc to be fixed in the rotational direction of the disc and the axial direction of the disc, and for radial relative adjustment motion between the teeth and adaptor disc;

adjustment means mounted on said disc for driving each of said teeth radially outward to adjust the teeth and compensate for both tooth and chain wear;

means for selectively locking said teeth fixedly to said adaptor disc in an adjusted position to produce a rigid sprocket assembly, and unlocking said teeth selectively to permit said radial adjustment motion between said teeth and said adaptor disc; and

said adjustment means including an adjustment disc coaxially mounted on said adaptor disc for limited relative rotation,

one of said discs having an annular array, at a fixed diameter, of axially extending bolt holes evenly spaced from each other,



the other of said disks having a number of axially through bolt holes equal in number to the bolt holes of said one disc and being in an annular array of said diameter, said holes of said other disc having unequal spacing from each other and being axially misaligned with the holes of said one disc in pairs so that the misalignment varies from one pair of misaligned holes to another pair of misaligned holes around the array, and

pin means, having an axially extending wedge surface, for inserting in a selected pair of misaligned holes to forceably align said holes and thereby relatively rotate said discs, and

said adjustment disc having radially outwardly facing cam surfaces respectively engaging each of said teeth for driving said teeth radially outward to adjust them for wear when said pin means relatively rotates said discs.

4,531,927

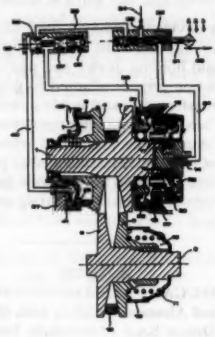
TRANSMISSION, IN PARTICULAR FOR A MOTOR VEHICLE

Theodorus P. M. Cadée, Goirle, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Sep. 16, 1983, Ser. No. 532,910
Claims priority, application Netherlands, Sep. 16, 1982, 8203581
Int. Cl.³ F16H *9/00*
U.S. Cl. 474—72 **3 Claims**

1. A transmission, in particular for a motor vehicle, provided with an infinitely variable V-belt transmission having a primary and a secondary pulley over which the V-belt has been looped, also provided with an input shaft which is connected through a reversing gear to the primary pulley, the said reversing gear being operated by means of a forward and a reverse command, respectively, in such a way as to transmit the same or the opposite direction of rotation, in which transmission the primary pulley is connected to an annular channel which is radially closed from the outside and into which a stationary pitot tube terminates for picking up a hydraulic signal depend-

ing on the speed of rotation, characterized by the incorporation of means of control which prevent the reverse signal



putting into operation the reversing gear, depending on the hydraulic signal.

4,531,928

BELT TRANSMISSION HAVING AIR COOLING FUNCTION

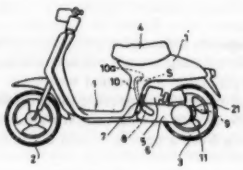
Yasuo Ikenoya, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 450,988

Claims priority, application Japan, Dec. 23, 1981, 56-192063[U]; Dec. 24, 1981, 56-194390[U]; Dec. 24, 1981, 56-211799; Dec. 29, 1981, 56-194810[U]; Jan. 18, 1982, 57-5836; Mar. 1, 1982, 57-28618[U]

Int. Cl.³ F16H *57/04*

U.S. Cl. 474—93 **19 Claims**



1. A belt transmission arranged in a vehicle having a body defining therein a substantially closed space, said belt transmission comprising:

a drive pulley;

a driven pulley;

a belt engaging with said drive pulley and said driven pulley;

a casing accommodating said drive pulley, said driven pulley, and said belt;

air inlet port means having a free end serving as an air inlet port and opening in said substantially closed space for introducing fresh air therein into said casing;

air outlet port means provided in said casing for discharging air from said casing;

fan means provided on at least one of said drive pulley and said driven pulley and rotatable in unison therewith;

said air inlet port means and said air outlet port means being disposed such that fresh air is sucked into said casing through said air inlet port means as said fan means rotates, to cool at least said drive pulley, said belt and said driven pulley, and is discharged from said casing through said air outlet port means.

4,531,929

APPARATUS FOR PRINTING, PUNCHING AND/OR CUTTING TO SIZE UNWOUND CARDBOARD PIECES

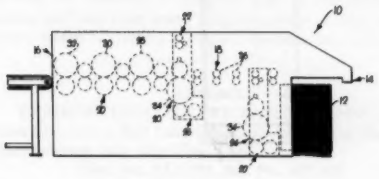
Manfred Schwardt, Reinfeld, Fed. Rep. of Germany, assignor to CORTEC, Wellpappenmaschinenhandelsund Service GmbH, Hamburg, Fed. Rep. of Germany

Filed Aug. 17, 1983, Ser. No. 524,246

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230833

Int. Cl.³ B65H *13/12*; B31B *1/04*

U.S. Cl. 493—55 **22 Claims**



1. An apparaus for performing a manufacturing operation on a plurality of generaly flat, separated sheets and for moving the sheets generally along a path of travel, said apparatus comprising:

means for transporting said separated sheets serially along said path of travel between a sheet entry point and a first location and between said first location and a sheet exit point;

work means disposed along said path of travel normally at said first location and operable for moving said sheets along said path of travel at said first location and for performing the desired manufacturing operation on each sheet as it passes said first location,

said work means being shiftable from said first location to a second location, said work means not performing said manufacturing operation when in said second location; and

conveying means disposed along said path of travel and shiftable to said first location for conveying said sheets along said path of travel at said first location when said work means is in said second location, said conveying means being shiftabele from said first location to a third location when said work means is in said first location.

4,531,930

PROCESS FOR THE PREPARATION OF A PAPER CONTAINER EQUIPPED WITH A REINFORCING RING, AND A REINFORCING RING FOR SUCH PROCESS

Gerhard Clauss, Donzdorf, Fed. Rep. of Germany, assignor to Michael Horauf Maschinenfabrik GmbH & Co. KG, Sussen, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,637

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322976

Int. Cl.³ B65D *5/64*

U.S. Cl. 493—108 **4 Claims**

1. A process for producing a paper container comprising the steps of:

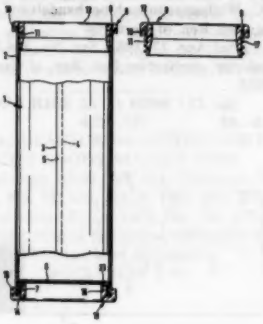
winding a jacket of sealable cardboard material such that said jacket includes inner and outer surfaces and upper and lower edges,

inserting a bottom element into said lower edge,

providing a reinforcing ring of a synthetic plastic material and having inner and outer surface portions, said inner surface portion including outwardly projecting thin-walled projections,

applying heat to said ring such that said projections are rendered plastically deformable, while remaining areas of said inner surface portion remain below the plastic deformation temperature,

thereafter placing said ring onto said upper edge of said jacket such that said inner and outer surface portions of



said ring contact said inner and outer surfaces, respectively, of said jacket, and such that the structure of said projections is destroyed.

4,531,931

APPARATUS FOR OPENING UP FOLDED BOXES

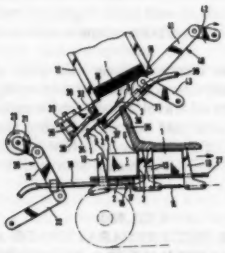
Walter Dietrich, Weinstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 464,096

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3207902

Int. Cl.³ B31B *1/80*

U.S. Cl. 493—317 **7 Claims**



1. An apparatus for opening flat-folded boxes and delivering the opened boxes to a moving conveyor which comprises:

a stationary magazine which receives said folded boxes,

a holding station disposed adjacent said magazine,

said holding station including a first stationary suction gripper for gripping an upper side of each folded box after removal from said stationary magazine,

a transfer device positioned relative to said magazine and said holding station,

said transfer device including a second suction gripper for removing one flat-folded box at a time from said magazine and for transferring said flat-folded box from said magazine to said holding device,

said transfer device further including a linkage mechanism upon which said second suction gripper is supported and which moves said second suction gripper back and forth on an arc-like path between a dead-center point under said magazine to said holding device,

said first suction gripper adapted to grip an upper side of said flat box received from said second suction gripper and to operate with said second suction gripper to partially open said flat folded box,

a moving conveyor for receiving opened boxes,

a delivery device for completely opening said folded box and delivering said completely opened box to said moving conveyor,

said delivery device including a third suction gripper,

means for moving said third suction gripper back and forth between said holding device and said moving conveyor,

said third suction gripper adapted to grip a bottom side of said box transferred to said holding device and adapted to move the box to said moving conveyor,

a stationary shunt means positioned between said magazine and said moving conveyor adapted to press said box to an open position when said third suction gripper delivers said partially open box from said holding device to said moving conveyor.

4,531,932

CENTRIFUGAL PLASMAPHERESIS DEVICE

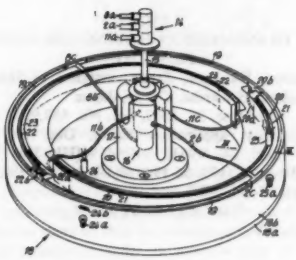
Libero Luppi, and Alessandro Calari, both of Mirandola, Italy, assignors to Dideco S.p.A., Mirandola, Italy

Filed Nov. 22, 1982, Ser. No. 443,975

Claims priority, application Italy, Nov. 27, 1981, 25336 A/81; Jan. 20, 1982, 19193 A/82

Int. Cl.³ A61M *5/00*; B04B *5/02*

U.S. Cl. 604—6 **9 Claims**



1. A centrifugation plasmapheresis device comprising:

a continuously rotating rotor for re-introducing red cells and collecting plasma in a provided vessel;

a rotating hollow shaft supporting said rotating rotor;

a single needle circuit having lines for admitting the whole blood drawn from a person to said continuously rotating rotor;

a rotating block rigidly attached to said rotating rotor and having outlets arranged in radial symmetry;

a static block supported by said rotating block and having outlets connected to said lines of said single needle circuit;

at least two slots symmetrically located and open at the top which are arranged in said rotating rotor;

said slots having constantly varying radii with respect to the rotation axis of said rotating rotor;

at least two pockets housed in said two slots wherein centrifugation separation of red cells from plasma is to take place;

said two pockets being formed from a collapsible flexible material;

two tubes one of each of said tubes connected to one end of each of said pockets which is inserted in the smallest radius region of said slots;

a small tube arranged along the entire circumference of the rotating rotor;

two diametrically opposed fittings each connected with an other end of said pockets which is inserted in the largest radius region and with said small tube, said fittings defining two semicircular portions of said small tube;

two opposed radial channels extending substantially from a centerline of each of said semicircles of said small tube

which are defined by said fittings and connected to said outlets of said rotating block;

automatically cyclically switching means for picking up the whole blood in a first step and for red cells re-introduction in a second step during steady state operation;

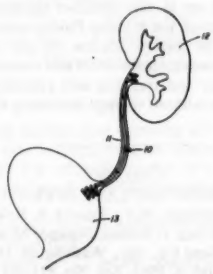
attemperating temperature means arranged in said rotating rotor for preventing the blood from cooling during its residence in said rotating rotor with attendant viscosity increase which adversely effect the separation process.

4,531,933

HELICAL URETERAL STENT

William J. Norton, Berkeley Heights, and Irwin S. Wolosky, Parsippany, both of N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Dec. 7, 1982, Ser. No. 447,679
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—8 **7 Claims**



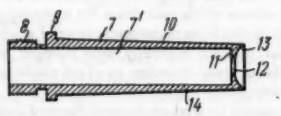
1. An adjustable length ureteral stent for maintaining drainage between the kidney and bladder consisting essentially of an elongated flexible tubular member provided with drainage means extending along the length thereof, retention means on the proximal end of the tubular member adapted to be received in the kidney, a plurality of helical coils formed on the distal end of the tubular member, at least one of which is adapted in use to remain in the bladder, the remaining coils being adapted to straighten out as an extension of the tubular member to provide length adjustment to accommodate said stent to different patient sizes, the central axis of the helix of the coils being substantially parallel to the portion of the tubular body between the coils and the proximal end retention means.

4,531,934

APPARATUS FOR THE FRAGMENTATION AND ASPIRATION OF OCULAR TISSUE

Leopold V. Kossovsky; Jury K. Kravchuk, both of Gorky; Alexandr V. Boiko, Moscow; Zinovy M. Slavinsky, Gorky; Georgy E. Stolyarenko, Gorky; Irina L. Kossovskaya, Gorky, and Alexandr I. Sorokin, Gorky, all of U.S.S.R., assignors to Gorkovsky Gosudarstvenny Meditsinsky Institute Imini S.M. Kirova, Gorky, U.S.S.R.

Filed Dec. 21, 1982, Ser. No. 451,769
Int. Cl.³ A61B *17/20*
U.S. Cl. 604—22 **5 Claims**



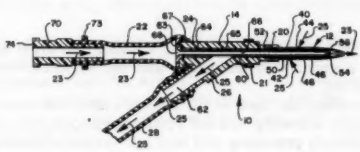
1. In a ultrasonic device adapted to fragment and aspirate ocular tissue comprising a controlled ultrasonic generator connected to a magnetostriction converter to convert electric vibrations into ultrasonic mechanical vibrations, and a hollow needle with an axially disposed bore having one end thereof connected to said magnetostriction converter to receive the mechanical vibrations to cause ocular tissues to be fragmented and to sever tissue that is to be aspirated, the other free end of said needle being adapted to be brought into contact with tissue that is to be removed, the improvement residing in that the end of said needle adapted for interaction with the tissue to be removed is provided with a transverse end wall portion means having a through opening with a diameter substantially less than the diameter of the axial bore of the needle, said opening and said bore being joined together at said end wall portion means to create a vacuum to aspirate the ocular tissue.

4,531,935

CARDIOPLEGIA/AIR ASPIRATION CANNULA

Richard Berryessa, Salt Lake City, Utah, assignor to Med-West, Incorporated, Salt Lake City, Utah

Filed Jan. 13, 1983, Ser. No. 457,693
Int. Cl.³ A61M *5/14, 25/00*
U.S. Cl. 604—45 **13 Claims**



1. An apparatus for delivering cardioplegic fluid to and for aspirating air from the aorta during cardiac surgery, said assembly comprising:

an inner cannula for forming a first lumen through which a cardioplegic fluid is delivered;

an outer flexible cannula for forming a second lumen through which air is aspirated, said outer cannula having at least one opening formed in the side thereof, said outer cannula having a substantially constant wall thickness and extending beyond the tip of said inner cannula, the forward end of said outer cannula being blunt and slightly tapered to sealing engage said tip of the inner cannula, such that the aspirated air and cardioplegic fluid will travel through said second and first lumens, respectively; and

means for connecting said first lumen to a source of cardioplegic fluid and for connecting said second lumen to a vacuum source.

4,531,936

DEVICE AND METHOD FOR THE SELECTIVE DELIVERY OF DRUGS TO THE MYOCARDIUM

Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60077

Continuation-in-part of Ser. No. 229,753, Jan. 29, 1981, abandoned. This application Jan. 12, 1983, Ser. No. 457,416
Int. Cl.³ A61B *19/00*
U.S. Cl. 604—49 **44 Claims**

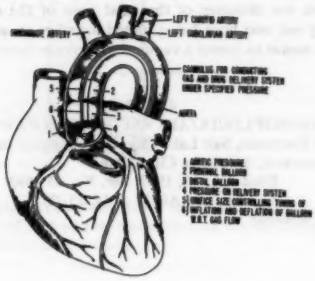
10. A process for the selective delivery of drugs or therapeutic agents to the coronary arteries and the heart in a living subject comprising the steps of:

determining the time of a left ventricular contraction of the subject,

immediately following said left ventricular contraction, inflating the proximal balloon of a two-balloon catheter device, which has a proximal balloon, a distal balloon, and a distal opening out through which the drug or therapeu-

tic agent can pass, in the subject's ascending aorta immediately above his aortic valve, to obstruct his aorta,

after said inflating has started, delivering the drug or therapeutic agent via said balloon catheter device out through said distal opening directly into the subject's coronary arteries continuously and only during diastole by continuously maintaining the drug or therapeutic agent at a pressure greater than the subject's diastolic pressure during diastole and less than the subject's systolic pressure during systole,



after said delivering has started, inflating said distal balloon to augment said delivering into the subject's coronary arteries,

determining the time of the subject's next left ventricular systole following said left ventricular contraction, and

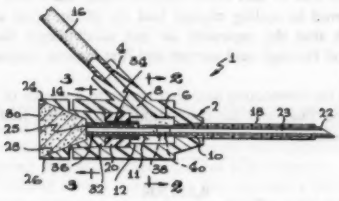
immediately preceding said next left verticular systole, deflating said proximal balloon and said distal balloon in the subject's aorta.

4,531,937

INTRODUCER CATHETER APPARATUS AND METHOD OF USE

Roy A. Yates, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jan. 24, 1983, Ser. No. 460,691
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—53 **20 Claims**



1. An introducer catheter apparatus comprising:

(a) a body with a first bore along a longitudinal axis and a second bore connecting to and in fluid communication with the first bore and disposed from the first bore to an exterior side surface of the body;

(b) a fluid transmitting means connected to the body and in fluid communication with the second bore;

(c) a flexible hollow tube means fixed in the first bore at a first end of the body;

(d) a deformable sealing means disposed in the first bore between a second opposite end of the body and the position within the first bore where the second bore connects to the first bore; and

(e) a retractable needle means comprising a needle having a tip and an opposite end, and a hub affixed to such opposite end, the hub including fluid trapping means for trapping fluid therein and a first hub section extending along the needle toward the needle tip, the retractable needle means adapted to be disposed in an inserted position wherein the first hub section penetrates and extends through the deformable sealing means to the first bore and the needle extends through the deformable sealing means, the body and the flexible hollow tube means with the tip of said needle extending past a distal end of the flexible hollow tube means, the hub further including conduit means for providing fluid communication from the first bore to the fluid trapping means when the retractable needle means is in the inserted position.

15. A method of priming a catheter, said catheter including a body chamber, conduit means in fluid communication with said body chamber, and fluid trapping means in communication with said conduit means, said fluid trapping means including means for retaining a priming fluid therein without spillage, said method comprising the steps of:

(a) pumping the priming fluid into the catheter body chamber and replacing the air in the chamber with said fluid;

(b) expelling that air in said chamber through the conduit means and through the priming fluid trapping means; and

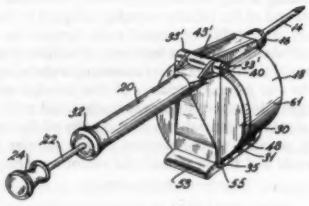
(c) transmitting at least a portion of said priming fluid through said conduit means when said chamber is substantially free of air and trapping said priming fluid in said trapping means without spillage indicating said catheter is primed.

4,531,938

MEDICAMENT IMPLANT APPLICATOR

Gordon E. Kaye, Garrison, N.Y.; Eugene B. Schwartz, Miami Beach, Fla., and Irving V. Sollins, Jiutepec Morelos, Mexico, assignors to Ivy-Gene Co., Inc., Washington, D.C.

Filed Jul. 6, 1983, Ser. No. 511,251
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—62 **6 Claims**



1. A medicament implanter comprising:

(a) a hollow needle; a plunger in axial alignment with and movable into said hollow needle; and means for moving said plunger into and out of said needle;

(b) a drum interposed between needle and said plunger moving means, said drum being adapted to retain therein adjacent the drum periphery a circlet form encasement containing a multiplicity of medicament implant dosage units, said encasement being a multiplicity of equally spaced apart parallel chambers and web sections connecting adjacent chambers, each chamber being adapted to contain therein one dosage unit of medicament implant;

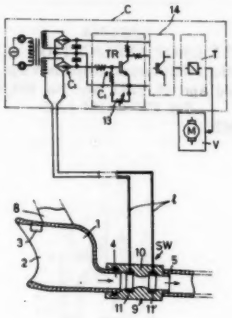
(c) an index means inside said drum for indexing one chamber of said circlet form encasement in axial alignment with needle and plunger whereby said plunger may move through the indexed chamber to expel medicament from said chamber; and

(d) actuator means located on the periphery of said drum for rotatably shifting said circlet form encasement within said drum to shift the indexed chamber thereof from said index means and the next adjacent chamber to said index means.

4,531,939
VACUUM SUCTION TYPE URINATING AID

Yoshitaka Izumi, Tokyo, Japan, assignor to Kimura Bed Mfg. Company Limited, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,877
Claims priority, application Japan, Oct. 12, 1979, 54-140957[U]; Oct. 12, 1979, 54-140960[U]
Int. Cl.³ A61M 1/06
U.S. Cl. 604—73 3 Claims



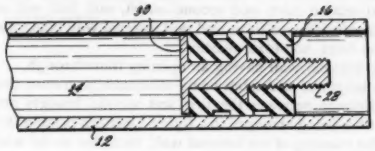
1. A vacuum suction type urinating aid comprising:
a urine receiver having a urine suction opening adapted to be applied to the urinating region of a subject to receive therefrom urine, an air suction opening, and a urine outlet;
a urine tank;
a urine transport tube connected between said urine outlet and said urine tank;
vacuum suction device means connected to said urine tank for drawing air into said urine receiver through said air suction hole therein and for drawing said air and any urine in said urine receiver through said urine outlet and said urine transport tube into said urine tank;
control circuit means connected to said vacuum suction device means for controlling stopping and starting thereof;
start switch means for transmitting a start signal to said control circuit means for starting operation of said vacuum suction device means, and for transmitting a stop signal to said control circuit means; and
said control circuit means including off delay timer means connected to said start switch means for, upon receipt therefrom of said stop signal, delaying stopping of said vacuum suction device means, thereby to maintain operation of said vacuum suction device means for a predetermined period of time, and thus for ensuring withdrawal of all urine from said urine receiver and said urine transport tube.

4,531,940
TAMPER-RESISTANT HYPODERMIC SYRINGE

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Continuation-in-part of Ser. No. 364,011, Mar. 31, 1982, abandoned. This application Aug. 19, 1983, Ser. No. 524,643
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.
Int. Cl.³ A61M 5/00
U.S. Cl. 604—111 7 Claims

1. An improved drive piston for a hypodermic syringe, of the type having a rigid insert and having a resilient sealing element that can be advanced and retracted within a tubular member and that has a front surface facing in the direction in which the resilient sealing element is advanced and a rear surface facing in the direction in which the resilient sealing element is retracted, and characterized in that the insert serves the multiple purposes of reducing stresses in the resilient sealing element when the drive piston is being moved, of rendering the drive piston impenetrable by a hypodermic needle and hence pilfer-proof, and of providing a means for positively attaching an actuating rod to the drive piston, said improved drive piston comprising:

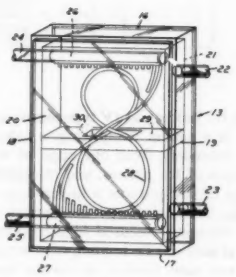


a rigid unitary insert having a shank portion that extends rearward from the rear surface of the resilient sealing element, and having a head portion whose diameter is less than the diameter of the bore of the tubular member by an amount not exceeding 0.018 inches and that is impenetrable by a hypodermic needle.

4,531,941
METHOD AND APPARATUS FOR ADMINISTERING BLOOD

Gerard A. Zasuwa, Redford, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Continuation of Ser. No. 415,817, Sep. 8, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 655,299
Int. Cl.³ A61M 5/00, 1/03
U.S. Cl. 604—113 5 Claims



1. An apparatus for rapidly raising the temperature of blood from a storage temperature of about 4° C. to body temperature in order that large quantities can be administered in a short time comprising
a housing of generally rectangular configuration having a top wall, a bottom wall, side walls, a front wall and a rear wall,
said housing including a first inlet for warming medium in a side wall thereof and a first outlet in a side wall thereof for removing the warming medium,
said housing including a second inlet in a side wall thereof for receiving blood and a second outlet in a side wall thereof for removing blood,
a first manifold connected to said second inlet and extending within said housing,
a second manifold connected to said second outlet and extending within said housing in generally parallel relation to said first manifold,
a plurality of discrete tubes within said housing,
each said tube having one end connected to said first manifold at longitudinally spaced points along said first manifold and the other end connected to said second manifold

at longitudinally spaced points along said second manifold,

an internal wall extending between said side walls, and front and back walls of said housing and dividing the housing in two parts, the first manifold being positioned in one part and the second manifold being positioned in the other part,

said second inlet, said second outlet, said first and second manifolds, said tubes and said internal wall being made of an inert, non-toxic plastic,

said internal wall having an opening therethrough,

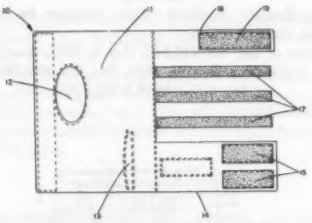
the length of said tubes being substantially greater than the distance between the first and second headers and the tubes being arranged in a figure-8 pattern passing through the opening of the internal wall, such that as the warming fluid flows from the first inlet to the first outlet, it is directed over the entire length of the tubes through which the blood to be warmed is flowing.

4,531,942

IV SECURING MEANS

Namon L. Turner, 602 Forest Grove Ave., Jacksonville, N.C. 28540

Filed Mar. 26, 1984, Ser. No. 593,545
Int. Cl.³ A61M *25/02*
U.S. Cl. 604—180 **9 Claims**



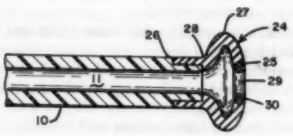
1. A means for holding an IV type means in place juxtaposed to the hand of a patient comprising: a palm portion; a wrist strap means extending from one edge of said palm portion, across the wrist of the patient, and releasably secured to the opposite edge of said portion; a finger strap means extending from one edge of said palm portion, across the fingers of the patient, and releasably secured to the opposite edge of said portion; and at least one IV holding strip means extending from one edge of said palm portion, across the hand of the patient, and releasably secured to the opposite edge of said portion whereby an improved, non-adhesive means is provided for securing an IV in place juxtaposed to the hand of the patient.

4,531,943

CATHETER WITH SOFT DEFORMABLE TIP

Robert A. Van Tassel, Minnetonka; Mark A. Rydell, Excelsior, and Gilmore T. Schjeldahl, Minnetonka, all of Minn., assignors to Angiomedics Corporation, Minneapolis, Minn.

Filed Aug. 8, 1983, Ser. No. 520,996
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—280 **13 Claims**



1. A catheter comprising:

(a) an elongated flexible tubular member having at least one lumen extending the length thereof; and

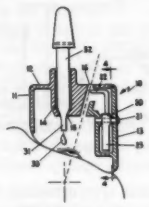
(b) a soft annular, deformable tip member affixed to the distal end of said catheter, said tip member including a circumferential preferential fold line located sufficiently close to the distal end of said tip member to allow collapse of said tip member along said preferential fold line upon being pressed against a relatively stationary surface without occluding said lumen.

4,531,944

EYE DROP APPLICATION AID

Samuel J. Bechtle, 24821 Argus, Mission Viejo, Calif. 92692

Filed Apr. 28, 1983, Ser. No. 489,691
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—302 **8 Claims**



1. An eye drop application aid for self-application of droplets of opthalmic solution by an individual comprising:

a housing having a top, side walls and an open bottom, the lower periphery of said side walls being contoured to conform to the facial area surrounding the eye socket;

an eye drop dispenser seat in said housing top having a central droplet discharge aperture therethrough for receiving and supporting the dispensing end of an eye drop dispenser a predetermined distance directly above the center of the eye and permitting droplets of opthalmic solution to be applied to the eye; and

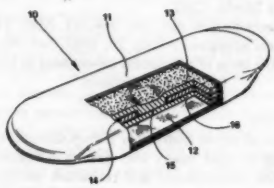
vertical alignment indicator means mounted to said housing adjacent to said dispenser seat in view of the eye being treated whereby said individual can be guided by said indicator to vertically align said eye drop dispenser end by head movement before d',spensing droplets of opthalmic solution to insure accurate application of said droplets to the eye.

4,531,945

MULTI LAYER SANITARY APPLIANCE

John P. Allison, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 31, 1983, Ser. No. 546,769
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—378 **4 Claims**



1. A secretafacient article comprising in combination;

(a) a fluid pervious cover

(b) a fluid impermeable baffle

(c) an absorbent system with at least three substantially coextensive layers including

(1) a first absorbent layer with relatively large capillaries with a top surface adjacent said cover and a bottom surface, said first absorbent layer including a zone through which fluid generally migrates downward; and

(2) a second absorbent layer with relatively small capillaries and a top surface adjacent the bottom surface of said first absorbent layer; said second layer having a bottom surface and at least one opening through said top and bottom surfaces beneath said zone in said first layer; and

(3) a third layer similar in capiliary size to said first layer with a top surface adjacent said bottom surface of said second layer and a bottom surface near said baffle, said top surface in contact with said bottom surface of said first layer through said at least one opening in said second layer.

4,531,946

AFTERTREATMENT OF DYED CELLULOSIC MATERIALS

Nick J. Christie, Mendham, N.J.; Randall A. Cox, Greenville, S.C.; Robert E. James, Rock Hill, S.C., and James C. Stevenson, Ft. Mill, S.C., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Mar. 9, 1983, Ser. No. 473,550
Int. Cl.³ D06M *15/52, 15/60;* D06P *5/02*
U.S. Cl. 8—192 7 Claims

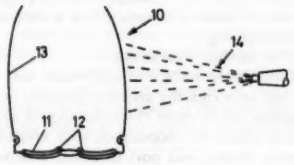
1. In a process for aftertreating dyed cellulosic materials and their blends, the improvement comprising aftertreating dyed cellulosic materials and their blends with a finish in an amount sufficient to improve wet and dry crockfastness, the finish comprising effective amounts of a blocked urethane prepolymer component and a reactive component which is a polyamide by applying, drying and curing the reactive and prepolymer components in the finish in situ on the materials and blends.

4,531,947

COLOR PROCESS FOR SPECTACLE FRAME COATED WITH POLYESTER

David R. Engelhardt, Edwardstown, Australia, assignor to R. Englehardt Nominees Pty. Ltd., Edwardstown, Australia

Continuation-in-part of Ser. No. 338,125, Jan. 8, 1982, abandoned. This application Mar. 26, 1984, Ser. No. 593,626
Int. Cl.³ B05D *5/06;* B29D *3/02;* C09D *3/02;* C25D *3/02*
U.S. Cl. 8—495 9 Claims



1. A method of colour coating a metal spectacle frames or a sunglasses frame having hinges joining relatively movable parts of such frame which includes the steps of

masking the inner surfaces of thelens support portions of said frame with masks,

coating the frame with a thick coat of polyester powder by electrostatic spray means, removing the masks from the frame and applying a thin coat of polyester powder to said inner surfaces,

baking the coated frame at a sufficiently high temperature to fuse said powder,

immersing the coated frame in a hot aqueous dye dispersion in the absence of any dye carrier, and for a length of time which is controlled to effect a depth of colour in said fused powder,

removing the coated frame from the dye dispersion, and

heating the coated frame to a temperature sufficient to cause diffusion of the dye into said fused coating.

4,531,948

ALCOHOL AND GASOHOL FUELS HAVING CORROSION INHIBITING PROPERTIES

Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 13, 1984, Ser. No. 619,978
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—53 7 Claims

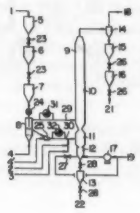
1. A liquid fuel adapted for use in an internal combustion engine, said fuel consisting essentially of 5 to 100 weight percent of one or more alcohols, 0 to 95 weight percent gasoline and a corrosion inhibiting amount of a combination of (A) at least one monoalkenylsuccinic acid wherein the alkenyl group contains about 8 to 30 carbon atoms and (B) a polyisobutenyl succinimide of an alkylenepolyamine.

4,531,949

ENTRAINED FLOW COAL GASIFICATION PROCESS

Syuntaro Koyama; Jinichi Tomuro, both of Katsuta; Tomohiko Miyamoto, Takahagi; Yoshiki Noguchi, and Yukio Hishinuma, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,034
Claims priority, application Japan, Aug. 25, 1982, 57-146082
Int. Cl.³ C10J *3/46*
U.S. Cl. 48—202 5 Claims



1. A process for gasifying coal by supplying pulverized coal separately to two different levels in an entrained flow gasifier which comprises supplying a coal powder having a partical size of 100 μm or less to an upper portion of the gasifier whereby gasification is conducted at 900° C. or higher in the absence of oxygen, supplying a coal powder including coarser particles and oxygen in an amount from that necessary for complete combustion of coal to a half of said necessary amount for complete combustion to a lower portion of the gasifier whereby gasification is conducted at a melting point of coal ash or higher, and leading the gases produced at the lower portion of the gasifier directly to the upper portion of the gasifier; the separation of pulverized coal supplied to the upper portion and to the lower portion of the gasifier being conducted by feeding the coal to a fluidizing gas flow and the feed rate of coal to the upper portion and to the lower portion is controlled by changing the gas flow velocity, whereby the coal entrained with the gas flow is supplied to the upper portion and the coal not entrained with the gas flow is supplied to the lower portion, and the feed rate of coal to the lower portion is larger than that to the upper portion.

4,531,950

METHOD AND APPARATUS FOR RECOVERING BLOWING AGENT FROM SCRAP FOAM

James G. Burt, Oxford, Pa., assignor to Cellu Products Company, Hickory, N.C.

Filed Dec. 19, 1983, Ser. No. 562,708
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—23 24 Claims

1. A process for recovering the volatile blowing agents contained in scrap expanded foam thermoplastic materials to permit reuse of the blowing agents in the production of the foam thermoplastic materials and to also reduce emissions of the blowing agents to the atmosphere, said process comprising

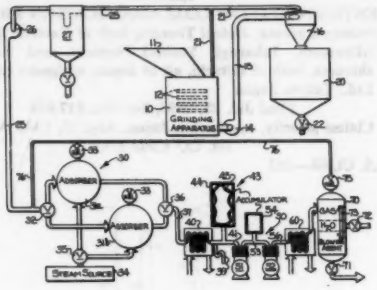
confining the scrap foam thermoplastic material in an enclosed area while grinding the scrap foam and releasing therefrom the volatile blowing agent trapped within the scrap foam,

withdrawing from the enclosed area a stream of air containing the released volatile blowing agent.

concentrating the stream of withdrawn blowing agent-laden air by selective adsorption-desorption on an adsorbent to increase the blowing agent concentration,

liquifying the blowing agent present in said concentrated stream of blowing agent-laden air to produce a liquid blow-

ing agent phase and a gaseous phase containing blowing agent vapor and air, and



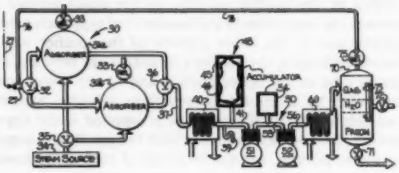
separating the liquid blowing agent phase from the gaseous phase and recovering the liquid blowing agent for reuse in the production of the foam thermoplastic material.

4,531,951

METHOD AND APPARATUS FOR RECOVERING BLOWING AGENT IN FOAM PRODUCTION

James G. Burt, Oxford, Pa., and Boyd M. Franklin, Blowing Rock, N.C., assignors to Cellu Products Company, Hickory, N.C.

Filed Dec. 19, 1983, Ser. No. 562,709
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—23 **22 Claims**



1. A process for recovering the volatile blowing agents employed in the production of expanded foam thermoplastic materials to permit their reuse in the production of the foam thermoplastic materials and to also reduce emissions of the blowing agents to the atmosphere, said process comprising

extruding a solution of the thermoplastic material and volatile blowing agent into a confined area while volatilizing the blowing agent to thereby expand and foam the thermoplastic material,

withdrawing from the confined area a stream of air containing the volatile blowing agent at a relatively low concentration,

concentrating the stream of withdrawn blowing agent-laden air by selective adsorption-desorption of the volatile blowing agent on an absorbent to increase the blowing agent concentration,

liquefying the blowing agent present in said concentrated stream of blowing agent-laden air to produce a liquid blowing agent vapor and air, and

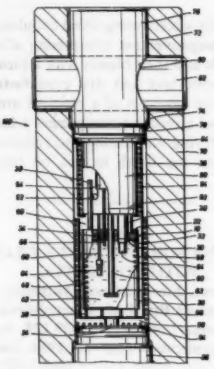
separating the liquid blowing agent phase from the gaseous phase and recovering the liquid blowing agent for reuse in the production of the foam thermoplastic material.

4,531,952

APPARATUS AND METHOD FOR EXCLUDING GAS FROM A LIQUID

Robert J. Murphy, Jr., Bellaire, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,772
Int. Cl.³ G01N *13/00*
U.S. Cl. 55—36 **20 Claims**



1. An apparatus for preventing diffusion of a gas under high pressure into the bulk of a liquid filling a substantially closed chamber, comprising:

a vessel for holding said liquid;

a port through the surface of said vessel, said port of sufficient size to permit the insertion into said vessel of means for testing one or more characteristics of said liquid;

a diffusion shield for cooperation with said vessel for substantially closing said port to define a liquid containing chamber;

means for maintaining a gas under high pressure exterior of said chamber and in fluid communication with said port; and

means for decreasing the volume of said chamber at a rate sufficient to prevent diffusion of said gas into the bulk of said liquid occupying said volume by moving one of said vessel or said diffusion shield.

4,531,953

SUBLIMATION OF AMINE COMPOUNDS ON ACTIVATED CARBON PORE SURFACES

James E. Groose, Oakdale, and Paul K. T. Liu, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 21, 1983, Ser. No. 506,486
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—74 **10 Claims**

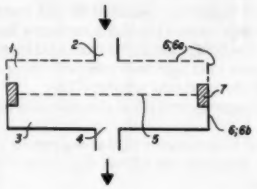
1. An activated carbon impregnated with at least one metal and impregnated in the absence of added water with 0.1 to 10%, by weight, of an amine compound selected from the group consisting of triethylene diamine, quinuclidine, and mixtures thereof, and having a moisture content after impregnation of 5.0% or less, by weight.

8. A process for the removal of toxic gases from a gas stream comprising passing the gas stream through an activated carbon impregnated with at least one metal and impregnated in the absence of added water with 0.1 to 10 percent, by weight, of an amine compound, selected from the group consisting of triethylene diamine, quinuclidine, and mixtures thereof, and having a moisture content after impregnation of 5 percent or less, by weight.

4,531,954
ARRANGEMENT FOR FILTERING A LIQUID

Wolfgang Klein, Klingenberg, Fed. Rep. of Germany, assignor to Akzo Nv, Arnhem, Netherlands

Filed Feb. 2, 1984, Ser. No. 576,529
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304951
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—159 27 Claims

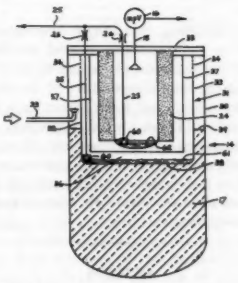


1. An arrangement for filtering a liquid and separating gases from the liquid, comprising a ventilatable housing having a peripheral wall, a first chamber with an inlet opening for a liquid to be filtered, a second chamber with an outlet opening for a filtered liquid; a wettable gas-impermeable microporous layer formed as partition between said chambers, said wettable gas-impermeable microporous layer being formed as a membrane composed of at least one hollow fiber; and at least a portion of said peripheral wall of said housing being composed of a liquid-repelling gas-permeable microporous material which forms a ventilating element arranged for separating a gas and ventilating said housing, said ventilating element being so positioned in at least said portion of said peripheral wall of the housing in at least one of said chambers so that separation of a gas from a liquid and withdrawal of the separated gas from said housing is performed in any position of the arrangement.

4,531,955
FLOODED COMPRESSOR SEPARATORS

John Cash, and John A. Kitchener, both of Richmond, Australia, assignors to Cash Engineering Co. Pty. Ltd., Richmond, Australia

Filed Feb. 28, 1984, Ser. No. 584,399
Claims priority, application Australia, Apr. 8, 1983, PF8806
Int. Cl.³ B01D *19/00, 45/06*
U.S. Cl. 55—185 13 Claims

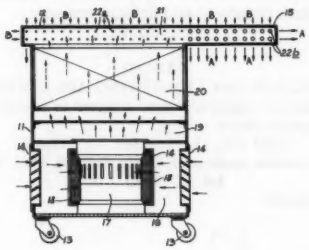


1. A liquid/gas separator for use with a flooded compressor system, said separator comprising a pressure vessel having a first lower region and a second region therewithin and an upwardly facing wall for maintaining a pool of liquid in the first lower region and for receiving a mixture of liquid and compressed gas in the second region above the pool of said liquid, a clean compressed gas outlet arranged in said upwardly facing wall of said vessel, a tubular filter element positioned for receiving the mixture of liquid and compressed gas and having a substantially vertical axis surrounding said gas outlet such that liquid is removed by said filter element from the mixture of liquid and compressed gas flowing therethrough from the second region of said vessel to said gas outlet, a container means having a base adjacent to but spaced below a lower extremity of said filter element and upstanding wall means whereby said base and said upstanding wall means define a dry sump region impervious to the liquid surrounding at least lower regions of said filter element, said liquid impervious upstanding wall means extending to a position adjacent to but spaced below said upwardly facing wall of the pressure vessel thereby defining at least one opening adjacent said upwardly facing wall of said pressure vessel for the mixture of liquid and compressed gas to flow to said filter element, and a liquid impervious shield member surrounding said filter element and overlaying said opening or openings arranged such that said shield member extends downwardly between said upstanding wall means and said filter element to a position at least intermediate the lower extremity of said filter element and said opening or openings above said impervious upstanding wall means thereby preventing liquid from the first region of said pressure vessel flowing into direct contact with said filter element.

4,531,956
STERILE AIR TROLLEY

Frederick H. Howorth, Farnworth, England, assignor to Howorth Air Engineering Limited, Farnworth, England

Filed Oct. 12, 1982, Ser. No. 433,810
Claims priority, application United Kingdom, Nov. 10, 1981, 8133944
Int. Cl.³ B01D *46/12*
U.S. Cl. 55—279 5 Claims



1. A sterile air trolley comprising:
a box-like casing having a four-sided lower region and an upper region extending laterally beyond all four sides of the lower region in forming a limb at one of the sides and an overhang at each of the other three sides,
an air inlet through each of the four sides of the lower region,
the upper region enclosing a diffusion chamber defined by an upper surface and sides and the undersides of the overhangs and of the limb,
a plurality of air outlets in the upper surface, the sides and the undersides of the overhangs and the limb of the diffusion chamber,
impeller means within the lower region,
a filter disposed across each air inlet,
the impeller means being operative to draw air into the lower region of the casing through the air inlets and filters and out of the casing by way of the air outlets of the upper region resulting in substantially vertical air flow from the upper surface and undersides and lateral air flow from the upper region sides to provide an effective sterile air zone in the immediate vicinity of the upper region, and

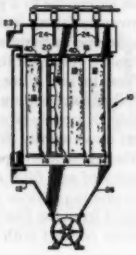
casters attached to the underside of the lower region.

4,531,957

FILTERING MATERIAL AND FILTRATION APPARATUS EMPLOYING THE FILTERING MATERIAL

Abdul Malik, 1417 Appleberry Way, West Chester, Pa. 19380

Filed Jan. 13, 1984, Ser. No. 570,379
Int. Cl.³ B01D *39/08, 46/02*
U.S. Cl. 55—360 **14 Claims**



13. Filtration apparatus comprising:

a filter bag comprising a perforated laminate of a plastic sheeting and a metalized coating adhesively attached to a fabric backing;

a housing structure within which said filter bag is mounted, said housing structure having an inlet through which fluid is introduced into said housing structure and an outlet through which fluid exits from said housing structure;

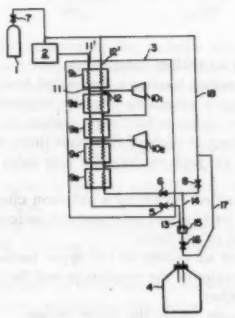
mounting means for mounting said filter bag within said housing structure and for electrically connecting said metalized coating to said housing structure.

4,531,958

HELIUM GAS LIQUEFYING APPARATUS

Yasuo Kuraoka, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

Filed Feb. 13, 1984, Ser. No. 579,671
Claims priority, application Japan, Feb. 14, 1983, 58-22576
Int. Cl.³ F25J *3/00*
U.S. Cl. 62—22 **1 Claim**



1. A helium gas liquefying apparatus, comprising in combination:

(a) a liquefied helium reservoir (4);

(b) a compressor (2) connected to the reservoir and receiving a helium gas stock, said compressor having an inlet side;

(c) a plurality of heat exchangers (9_1, 9_3) connected to the compressor and to each other in series by a series liquefying line;

(d) a plurality of expansion enginer (10_1, 10_2) connected in parallel with corresponding heat exchangers, including a final stage;

(e) a Joule-Thompson valve (5) connected from the outlet of said liquefying line to said reservoir;

(f) a series return line disposed in reverse flow of said heat exchanger to said liquefying line and connected to the compressor inlet side;

(g) a return valve (6) connected to said reservoir;

(h) a recovery valve (19) and a recovery line (18), said recovery line being connected from said reservoir (4) to said compressor inlet side, said recovery valve (19) controling the flow through said recovery line;

(i) a first thermometer (20) at the inlet side of the final stage engine;

(j) a second thermometer (21) at the return valve (6);

(k) a third thermometer (22) at said Joule-Thompson valve inlet side;

(l) a pressure gage (23) at the recovery valve inlet side;

(m) a controller (24) coupled to said first, second and third thermometers (20, 21, 22) and said pressure gage (23) receiving signals therefrom, with manual means to manually control the operation of the Joule-Thompson valve (5), the return valve (6) and the recovery valve (19); and, in operation, the compressor is first operated to raise the supply pressure to about 15.5 kg/cm², also, said manual means having,

(n) means for enabling, in a first operation, the Joule-Thompson valve (5) and the return valve (6) to be closed, and the recovery valve (19) to be opened to operate the cooling of the heat exchangers, until the inlet temperature of the expansion engine final stage is decreased to approximately 20° K. and gas in the reservoir (4) is returned through the recovery valve (19) to the recovery line (18);

(o) means for enabling, in a second operation, the return valve (6) to be fully opened, the Joule-Thompson valve (5) being gradually opened, the recovery valve (19) remains opened, and these valves are maintained in this state manually until the inlet temperature of the Joule-Thompson valve (5) is depressed to approximately 20° K. and the internal pressure of the reservoir (4) is reduced to about 0.4 kg/cm² so that gas phase helium flows in the series return line to the outlet of return valve (6), the reservoir (4), the recovery valve (19) and recovery line (18) so that the heat exchangers are not additionally heated;

(p) means for enabling, in a third operation, the Joule-Thompson valve (5) to be further opened and the temperature of the return valve (6) becomes equal to or lower than 30° K.;

(q) means for enabling, in a fourth operation, the recovery valve (19) to be stepwisely closed so that the internal pressure of the reservoir (4) equals to or is lower than 0.4 kg/cm² and the inlet temperature of the Joule-Thompson valve (5) becomes equal to or lower than 20° K., and the recovery valve (19) is closed stepwisely to prevent an abrupt pressure rise of the reservoir (4); and,

(r) means for enabling, in a fifth operation, the recovery valve (19) to be eventually fully closed and the Joule-Thompson and return valves are opened to the set position to start the apparatus.

4,531,959

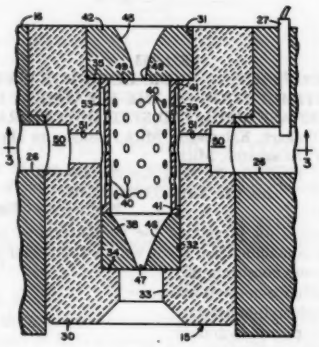
METHOD AND APPARATUS FOR COATING OPTICAL FIBERS

Gitimoy Kar, Painted Post, and Thomas O. Mensah, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,515
Int. Cl.³ C03B *25/02*
U.S. Cl. 65—3.11 **7 Claims**

7. A method of making a coated fiber by applying a coating

layer to a bare fiber or to an intermediate coated layer thereon by directing under pressure a coating liquid substantially radially inwardly toward said fiber while said fiber passes through a chamber, characterized in that the substantially radial flow of said liquid is maintained over a length of the fiber of less than



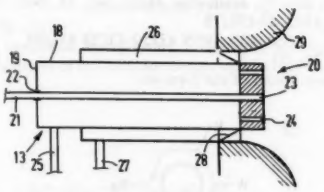
1.27 cm by drawing said fiber through a sleeve having holes through the wall thereof the diameter of the holes being between 0.064 and 0.125 cm., the axial portion of said sleeve constituting said chamber, said coating liquid being supplied to the outer surface of said sleeve at a pressure less than 50 psi for draw speeds over 3 m/sec.

4,531,960

GLASSMAKING PROCESS AND EQUIPMENT

Marc Desprez, Courbevoie, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 18, 1984, Ser. No. 611,599
Claims priority, application France, May 20, 1983, 83 08362
Int. Cl.³ C03B *55/44*
U.S. Cl. 65—134 **17 Claims**



1. A glassmaking process comprising introducing, at a first end of a furnace, a mixture of powdered mineral substances forming a carpet which progressively separates into clots on a surface of a bath of already-formed molten glass, heating said mixture and continuously discharging, at a second end of the furnace opposed to said first end, the molten glass thus obtained, the heating of the mixture being effected by means of at least one flame of a fuel and oxygen so as to heat, in a more intense manner than the rest of the furnace, the zone in the vicinity of a region where the mixture of powdered mineral substances is charged, with a current of auxiliary gas surrounding the flame of the fuel and oxygen being injected into the furnace, and with said flame of fuel and oxygen thus surrounded by the current of auxiliary gas being directed onto clods of said powdered mineral substances floating on the bath of molten glass, wherein the current of auxiliary gas is injected generally axially around the flame of fuel and oxygen.

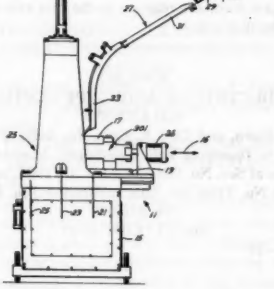
11. Equipment for carrying out a glassmaking process, wherein a mixture of powdered mineral substances forms a carpet which progressively separates into clods which float on the surface of an already-formed molten glass bath, comprising a furnace, means for introducing the powdered mineral substances adjacent a first end of the furnace, means for heating said mineral substances during their passage through the furnace, means for discharging the molten glass obtained adjacent a second end of the furnace opposed to said first end, said heating means comprising at least one oxygen-fuel burner, which oxygen-fuel burner is directed toward said clods floating on the bath of molten glass, and a coaxial sleeve combined with means for supplying an auxiliary gas and means for injecting a generally axial current of said auxiliary gas around the flame of said oxygen fuel burner, said sleeve surrounding at least a part of the length of said oxygen fuel burner such that said current of said auxiliary gas serves to prevent overheating of said burner without causing condensation of contaminant materials from the furnace gases onto said burner.

4,531,961

MODULAR SECTION MOLDING PRESS AND MOLD CLAMPING AND ARTICLE REMOVAL MECHANISM THEREFOR

Kenneth R. Hileman, Anderson; Ronald H. Shields, and Lance M. Tobey, both of Alexandria, all of Ind., assignors to Lynch Machinery, Anderson, Ind.

Filed Jul. 29, 1983, Ser. No. 518,529
Int. Cl.³ C03B *9/40*
U.S. Cl. 65—164 **13 Claims**



1. Apparatus for manufacturing molded articles including:

a plurality of independent mold section presses, each said mold section press including,

(i) a female mold,

(ii) a male mold means, actuable for movement on said mold section press relative to said female mold to engage with said female mold at a mold station for molding an article,

(iii) slide carriage means for moving said female mold horizontally, linearly to a separate charge receiving station from said mold station, said slide carriage means supporting said female mold on said mold section press, and

(iv) charge delivery means on said mold section press for receiving and then guiding a charge to said female mold at said charge receiving station,

scoop means for delivering individual charges as they are formed in succession to separate ones of said charge delivery means of said plurality of mold section presses, and

control means for operating said scoop mechanism, said plurality of slide carriage means, and said plurality of male mold means for moving each said male mold means and its respective carriage means in synchronism with control of each other and of said scoop means and control means

being operatively located with said plurality of mold section presses.

4. A modular section molding press for manufacturing molded articles comprising:

(i) a base structure,

(ii) at least one female mold,

(iii) a slidable carriage mounted on the base structure and having the female mold mounted thereon, the carriage adapted to move the female mold horizontally, linearly among a charge receiving station, a mold station and an extraction station,

(iv) a press tower mounted on the base structure adjacent the slidable carriage,

(v) at least one male mold mounted on the press tower for movement to and from engagement with the female mold at the mold station for molding articles, and

(vi) control means for operating the slidable carriage and male mold, for moving the slidable carriage in synchronism with movement of the male mold.

13. A take out mechanism in a modular section molding press with a base structure and a mold positionable at an extraction station, the take-out mechanism mounted on the base structure and adapted to grasp molded articles from the female mold at the extraction station, move such articles to a take-out station and release such articles at the take-out station, the take-out mechanism including jaw members slidably movable relative to each other for grasping and releasing molded articles in succession, at least one at a time, means for pivotably supporting the jaw members about two perpendicular axes, and means for pivoting the jaw members about the two perpendicular axes for moving the jaw members to and from the extraction and take-out stations, the two axes being a first axis and a second axis, the means for pivoting being means for pivoting both the jaw members and the first axis about the second axis and further being means for reversing the orientation of the jaw members relative to the first axis during pivoting about the first axis.

4,531,962

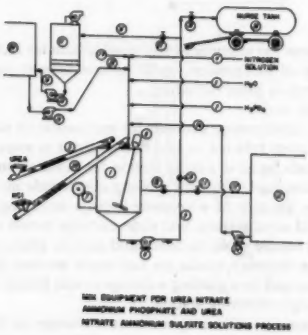
PRODUCTION OF ACID-TYPE FERTILIZER SOLUTIONS

Frank P. Achorn, and Carl A. Cole, Jr., both of Killen, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 588,833, Mar. 12, 1984, now Defensive Publication No. T104,701. This application Jun. 4, 1984, Ser. No. 616,879

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—29 **9 Claims**



MIX EQUIPMENT FOR UREA NITRATE AMMONIUM PHOSPHATE AND UREA NITRATE AMMONIUM SULFATE SOLUTIONS PROCESS

7. A high-analysis in situ partially ammoniated liquid fertilizer solution which is the reaction product of urea, phosphoric acid, and commercial nitrogen solution, said solution having a grade ranging from about 27-9-0 to about 8-24-0 and said solution characterized by the fact that said solution has a urea nitrogen:ammonium nitrate, N mole ratio ranging from about 2.5 to about 3.5 and a salting-out temperature ranging from about 45° F. to about −5° F., said salting-out temperature being in direct and inversely proportional relationship to said urea nitrogen:ammonium nitrate, N mole ratio.

4,531,963

USE OF PHENYL HYDRAZINES FOR SEED BIOSTIMULATION OR THE TREATMENT OF LIPOXYGENASE MEDIATED SEED DETERIORATIONS

Donald P. Wallach, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 30, 1982, Ser. No. 431,906

Int. Cl.³ A01N *33/06, 33/08*

U.S. Cl. 71—77 **4 Claims**

2. A method for promoting the germination of oil seeds comprising contacting said seeds with a compound selected from the group consisting of:

(α,α,α-trifluoro-m-tolyl)-hydrazine;

(o-chlorophenyl)-hydrazine;

1-benzyl-1-phenyl-hydrazine;

(α,α,α-trifluoro-o-tolyl)-hydrazine;

1-phenyl-1-(tetrahydro-3-thienyl)-hydrazine;

(6-chloro-α,α,α-trifluoro-m-tolyl)-hydrazine; and

(1-naphthyl)-hydrazine;

or an acid addition salt or hydrate thereof; in an amount effective to promote seed germination.

4,531,964

HETEROCYCLIC COMPOUND AND A HERBICIDAL COMPOSITION CONTAINING SAID COMPOUND

Shizuo Shimano, Ageo; Shinichi Kobayashi, Fuchu; Mikio Yanagi, Okegawa; Osamu Yamada; Mikio Saito, both of Ageo, and Fumio Futatsuya, Ohmiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

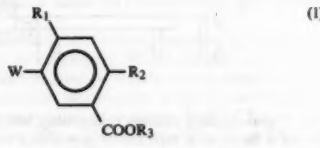
Filed Aug. 29, 1983, Ser. No. 527,493

Claims priority, application Japan, Sep. 13, 1982, 57-158228; Oct. 15, 1982, 57-175175

Int. Cl.³ A01N *43/50*; C07D *471/04*

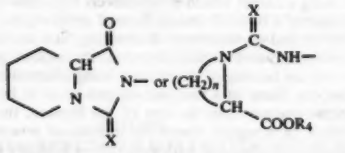
U.S. Cl. 71—92 **11 Claims**

1. A compound of the formula:



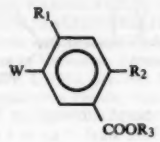
(I)

wherein W is



wherein R_4 is lower alkyl, X is oxygen or sulfur, and n is integer of 3 or 4; R_1 is hydrogen or halogen; R_2 is halogen; R_3 is hydrogen or C_1–C_8-alkyl which may be substituted by lower alkoxy.

9. A method for killing weeds which comprises applying to weeds or the locus thereof a herbicidally effective amount of a compound of the formula:



(I)

wherein R_1, R_2, R_3 and W are defined as in claim 1.

4,531,965

WEED CONTROL METHOD AND COMPOSITION

Jacques Meyer, Zofingen, and Walter Schären, Vordemwald, both of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed Nov. 22, 1982, Ser. No. 443,373

Claims priority, application Switzerland, Nov. 7, 1981, 7595/81

Int. Cl.³ A01N *43/54*

U.S. Cl. 71—92 **5 Claims**

1. In the method of controlling a broad spectrum of weeds in a vineyard or fruit plantation, by applying thereto in a post-emergence treatment an effective amount of a selectively herbicidal composition comprising different active herbicidal ingredients; the improvement consisting essentially of applying said composition in a single effective treatment by one-time spraying of said vineyard or fruit plantation after emergence of said weeds, said composition comprising a combination of methyl-5-(2,4-dichlorophenoxy)-2-nitrobenzoate as a first active ingredient (I) admixed with 3-tert.butyl-5-chloro-6-methyl-uracil as a second active ingredient (II); said combination containing about 1 to about 5 parts, by weight, of said second active ingredient (II) per each part, by weight, of said first active ingredient (I).

4,531,966

HERBICIDE COMPOSITIONS

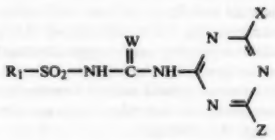
Laddie L. Green, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 11, 1983, Ser. No. 474,221

Int. Cl.³ A01N *25/32*

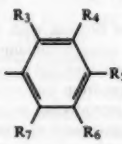
U.S. Cl. 71—93 **15 Claims**

1. An herbicidal composition comprising an herbicidally effective amount of an herbicide compound having the formula



wherein

R_1 is



R_3 and R_6 are independently hydrogen, halogen, alkyl, alkoxy, nitro, trifluoroalkyl, cyano, $CH_3S(O)_n$— or $CH_3CH_2S(O)_n$—;

R_4 is hydrogen, halogen, or alkyl;

R_5 is hydrogen, halogen, alkoxy or alkoxy;

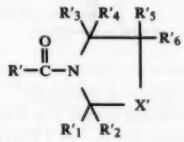
R_7 is hydrogen, halogen, alkyl, or alkoxy

N is 0, 1 or 2;

W is sulfur or oxygen;

X is hydrogen, halogen, alkyl, trifluoroalkyl, thioalkyl, or alkoxyalkyl; and

Z is alkyl or alkoxy; or their ariculturally acceptable salts; and an antidotally effective amount of an antidote compound having the formula



in which

X' is oxygen or sulfur, R' is haloalkyl having 1 to 10 carbon atoms, inclusive, and the term halo includes chloro and bromo substitutions, alkyl having 1 to 10 carbon atoms, inclusive, or alkylthio having 1 to 4 carbon atoms, inclusive, R'_1, R'_2, R'_3, R'_5 and R'_6 are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive, alkoxyalkyl having a total of 2 to 4 carbon atoms, inclusive, and lower alkylol having 1 to 4 carbon atoms, inclusive.

4,531,967

SUBSTITUTED PHENYLALKYL QUINCLIDINUM SALTS AND THEIR USE AS PLANT GROWTH CONTROL AGENTS

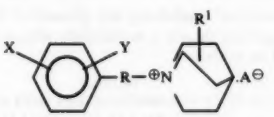
John C. Van Heertum, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 13, 1983, Ser. No. 541,769

Int. Cl.³ A01N *43/40*; C07D *453/02*

U.S. Cl. 71—94 **35 Claims**

22. A method for enhancing the growth of plants to obtain an increase in weight or size of said plants which comprises contacting plants or plant parts or their habitat with a growth enhancing amount of a composition containing as the active material a compound corresponding to the formula



wherein

R represents methylene, ethylene or ethylidene;

R^1 represents hydrogen, hydroxy, chloro, bromo, fluoro, iodo, cyano, —$COOR^2$, oxo or acetoxy;

Y represents hydrogen, chloro, bromo, iodo or fluoro;

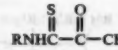
X represents hydrogen alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkynyloxy of 2 to 6 carbon atoms, cyano, trifluoromethyl, (trifluoromethyl)thio, (trifluoromethyl)sulfonyl, trifluoromethoxy, —$COOR^2$ wherein R^2 is alkyl of 1 to 6 carbon atoms, —$C(O/S)NR^3R^4$ wherein R^3 represents R^2, alkenyl of 2 to 6 carbon atoms or alkynyl of 2 to 6 carbon atoms and R^4 represents R^3 or hydrogen, or —$S(O)_2NR^2R^3$ and with the proviso that X and Y cannot both be hydrogen at the same time A represents a non-phytotoxic anion.

4,531,968
THIOPYRUVIC AMIDE COMPOUNDS

William L. Schinski, San Rafael, and Raymond J. Lukens, Walnut Creek, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 30, 1984, Ser. No. 595,225
Int. Cl.³ A01N 9/12; C07C 153/05
U.S. Cl. 71—98 6 Claims

1. A compound of the formula:



wherein
X is chloro, fluoro, bromo or iodo; and
R is cyclohexyl substituted with 0, 1 or 2 lower alkyl groups, or phenyl substituted with 0, 1 or 2 lower alkyl groups.

4. A compound in accordance with claim 1 wherein R is cyclohexyl and X is chloro.

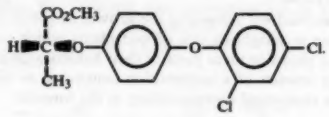
6. A method for controlling viral diseases of plants comprising applying to the plants a viricidally effective amount of the compound of claim 4.

4,531,969
HERBICIDAL ESTERS OF D-1-(PHENOXY-4-PHENOXY)PROPIONIC ACID

Hans J. Nestler, Königstein; Gerhard Hörlein, Frankfurt am Main; Reinhard Handte, Hofheim am Taunus; Hermann Bieringer, Eppstein; Friedhelm Schwerdtle, Frankfurt am Main, and Peter Langelüddeke, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,427
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 27580025
Int. Cl.³ A01N 371/17; C07C 9/74
U.S. Cl. 71—108 12 Claims

1. Compound of the formula



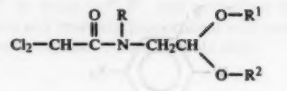
6. A method for combatting the growth of weeds which comprises applying thereto a herbicidally effective amount of a compound as in claim 1.

4,531,970
ANTIDOTAL COMPOUND AND METHOD

Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 218,874, Dec. 22, 1980, Pat. No. 4,443,698, which is a continuation-in-part of Ser. No. 106,433, Dec. 26, 1979, abandoned. This application Nov. 25, 1983, Ser. No. 555,096
Int. Cl.³ A01N 37/22
U.S. Cl. 71—118 10 Claims

1. A composition containing:
(a) a herbicidally effective amount of S-alkyl thiocarbamate; and
(b) an antidotally effective amount of a compound represented by the formula:



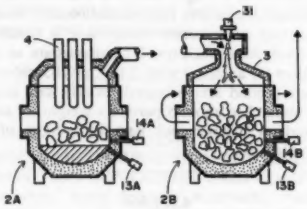
wherein: R is 2-propenyl, 2-butenyl or 2-methyl-2-propenyl; and R^1 and R^2 are alkyl of up to 4 carbon atoms.

9. A composition containing a herbicidally effective amount of S-ethyl diisopropyl thiocarbamate or S-ethyl diisobutylthiocarbamate and an antidotally effective amount of N-(2,2-dimethoxyethyl)-N-(2-propenyl)-2,2-dichloroacetamide.

4,531,971
METHOD OF AND APPARATUS FOR MELTING SCRAP

Sabro Sugiura; Senji Fujita, both of Nagoya; Kenji Kanada, Chita; Noboru Demukai, Gifu, and Tetuo Okamoto, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 4, 1984, Ser. No. 568,162
Claims priority, application Japan, Feb. 16, 1983, 58-24369
Int. Cl.³ C21C 5/52
U.S. Cl. 75—13 8 Claims



1. A method of melting iron scrap comprising the steps of:
(I) loading each one of a pair of arc furnaces with batches of iron scrap and inserting a set of electrodes into the first of the pair of furnaces and commencing the melting of the batch of scrap in the first furnace;
(II) blowing an oxygen-containing gas and injecting a carbonaceous material into said first furnace in which the batch of scrap is being melted thereby to oxidize the carbonaceous material mainly to CO and delivering the hot exhaust gas containing CO to the second of the pair of furnaces while supplying said oxygen-containing hot gas thereto so as to oxidize the CO into CO_2 thereby to heat the batch of scrap in said second furnace by the sensible heat possessed by the hot exhaust gas and the heat generated through the oxidation;
(III) discharging the molten iron from said first furnace after completion of the melting while shifting the set of electrodes to said second furnace to commence the melting of the batch of scrap in said second furnace by the heat of arc;
(IV) loading said first furnace with a new batch of scrap while blowing an oxygen-containing gas and injecting carbonaceous material into said second furnace, and delivering the exhaust gas from said second furnace into said first furnace while introducing an oxygen-containing gas thereby to heat the new batch of scrap in said first furnace;
(V) discharging the molten iron from said second furnace after completion of the melting while shifting the set of electrodes to said first furnace to commence the melting of the new batch of scrap in said first furnace; and
(VI) repeating the above steps II to V.

4,531,972

METHOD FOR THE FABRICATION OF STEELS WITH HIGH MACHINABILITY

André Gueussier, Paris, and Edmond Vachiery, Solesmes, both of France, assignors to Vallourec, Adenauer, France

Filed Nov. 2, 1983, Ser. No. 548,212
Claims priority, application France, Mar. 15, 1983, 83 04611
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 12 Claims

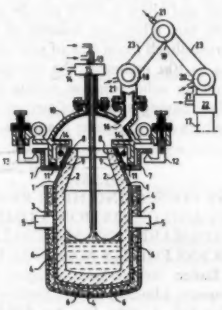
1. A method for the preparation of a steel with high machinability wherein a non-alloyed, alloyed of stainless steel is worked up by melting, the method comprising adding aluminum to said steel to reduce the oxygen content of the steel to less than 100 ppm, desulfurizing said steel by utilizing a basic slag to reduce the sulfur content of the steel to less than 100 ppm, and adding calcium and sulfur by means of at least one cored wire to attain a content of calcium of 20 to 100 ppm and a sulfur content of 150 to 500 ppm in the steel.

4,531,973

METALLURGICAL PROCESSES

Ivor G. Nixon, ler Stock Ost, "Matterhorngruss", Steinmattstrasse, 3920 Zermatt, Valais, Switzerland

Continuation of Ser. No. 249,495, Mar. 31, 1981, abandoned.
This application Jul. 5, 1983, Ser. No. 510,926
Claims priority, application United Kingdom, Apr. 8, 1980, 8011546
Int. Cl.³ C21C 7/00
U.S. Cl. 75—59.1 19 Claims



1. A method for carrying out a metallurgical process which includes generating heat and a controlled atmosphere by means of an oxy-fuel or air-fuel burner, wherein fuel consumption is reduced and efficiency improved said method comprising using a fuel which has a heat of decomposition selected from exothermic and zero and consisting substantially of hydrocarbons and mixtures of hydrocarbons having 1 or more double bonds, including those having a ring structure or fused ring structure, hydrogen and carbon.

4,531,974

WORK-HARDENABLE AUSTENITIC MANGANESE STEEL AND METHOD FOR THE PRODUCTION THEREOF

Bernd Kos, Leoben, Austria, assignor to Vereinigte Edelstahlwerke AG (VEW), Vienna, Austria

Filed Oct. 11, 1983, Ser. No. 540,649
Claims priority, application Austria, Apr. 13, 1982, 1435/82
The portion of the term of this patent subsequent to Mar. 30, 2000, has been disclaimed.
Int. Cl.³ C22C 39/30
U.S. Cl. 75—123 N 20 Claims

1. A work-hardenable austenitic manganese steel having an elongation at rupture of 10 percent to 80 percent, as measured according to L=5 d or L=10 d, and essentially consisting of, each in percent by weight:

0.7 to 1.7 C
5.0 to 18.0 Mn
0 to 3.0 Cr
0 to 4.0 Ni
0 to 2.5 Mo
0.1 to 0.9 Si
up to 0.1 P

with the proviso that the carbon-to -manganese ratio is between 1:4 and 1:14, and containing an amount of micro-alloying elements in percent by weight:

0.0 to 0.2 Ti
0.0 to 0.05 Zr

with the proviso that the sum Ti+Zr is in the range of 0.002 percent by weight to 0.25 percent by weight, the remainder iron and impurities arising during the melting process.

4,531,975

ANTI-FOULING COMPOSITIONS

Frederik Salome, Sydney, Australia, assignor to Berger, Jenson & Nicholson, Limited, London, England

Continuation of Ser. No. 382,361, May 26, 1982, abandoned.
This application Jan. 25, 1984, Ser. No. 573,597
Claims priority, application Australia, May 29, 1981, PE9095
Int. Cl.³ C09D 5/14
U.S. Cl. 106—18.3 9 Claims

1. In a marine anti-fouling liquid paint composition containing resin, marine toxin and solvent, the improvement comprising hollow particles of glass or sodium borosilicate having substantially no internal porosity, a particle size of from 1 to 800 microns, an apparent bulk density of 0.1 to 0.5 g/cc, as measured by liquid displacement, and present in an amount sufficient to give a particle concentration in a dry film formed from the composition of from 10% to 80% by volume.

4,531,976

HETEROLOGOUS INK JET INK COMPOSITIONS

An-Chung R. Lin, New Town, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 331,603, Dec. 17, 1981, Pat. No. 4,386,961. This application Jun. 6, 1983, Ser. No. 501,074
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.³ C09D 11/06
U.S. Cl. 106—27 9 Claims

1. An ink composition for use in an ink jet apparatus comprising: oleic acid and a mixture selected from the group of mixtures consisting of (a) a mixture of propylene glycol and benzyl alcohol, and (b) a mixture of an ethylene glycol of the formula $H(OCH_2CH_2)_nOH$ wherein n is from 2 to 5 and methoxy-triglycol.

4,531,977

PROCESS FOR PRODUCING SUPERPLASTIC ALUMINUM ALLOY STRIPS

Ryoji Mishima, Yokohama, and Hitoshi Miyamoto, Kawasaki, both of Japan, assignors to Kasei Naoetsu Light Metal Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP82/00292, § 371 Date Mar. 28, 1983, § 102(e) Date Mar. 28, 1983, PCT Pub. No. WO83/00510, PCT Pub. Date Feb. 17, 1983
PCT Filed Jul. 28, 1982, Ser. No. 483,951
Claims priority, application Japan, Jul. 30, 1981, 56-119900
Int. Cl.³ C22F 1/04
U.S. Cl. 148—2 5 Claims

1. A process for producing a strip of a superplastic aluminum alloy, comprising the steps of:

(a) continuously casting and rolling a molten aluminum alloy consisting essentially of 4.0 to 6.0% (by weight) of magnesium, 0.4 to 1.5% (by weight) of manganese, 0.05 to 0.2% (by weight) of chromium and less than 0.50% (by weight)

of silicon thereby preparing a cast strip of 3 to 20 mm in thickness;

(b) annealing the cast strip at a temperature of 420° to 530° C.;

(c) subjecting the annealed strip to a first stage of cold rolling and intermediate annealing; and

(d) then subjecting the intermediately annealed strip to a second stage of cold rolling until the reduction ratio reaches a value of not less than 60%.

4,531,978

METHOD OF FORMING CHROMATE CONVERSION COATINGS ON ALUMINUM SURFACES AND THE COATING FORMED THEREBY

Joseph V. Otrhalek, Dearborn, Mich., and Donald R. Gerard, Bowling Green, Ky., assignors to Detrex Chemical Industries, Inc., Southfield, Mich.

Filed Apr. 11, 1983, Ser. No. 483,775

Int. Cl.³ C23F 7/26, 7/10

U.S. Cl. 148—6.16 **11 Claims**

1. The method of forming a regular chromate conversion coating on a metal surface said metal selected from the group consisting of aluminum and alloys of aluminum comprising immersing said surface in an accelerator-free aqueous acidic solution containing hexavalent chromium ions and at least one activator, subjecting said metal surface and said solution to ultrasonic energy generated from about 18 kilohertz to about 60 kilohertz by an ultrasonic transducer wherein the intensity of said ultrasonic energy impinging upon said immersed metal surface is an amount within the range of from about 0.00565 W/Cm^2 to about 0.0631 w/CM^2.

4,531,979

SEALING OF ANODICALLY OXIDIZED ALUMINUM OR ALUMINUM ALLOY SURFACES AND COMPOUNDS USEFUL THEREFOR

Hans Bohler, Rheinfelden, and Ernst Weisskopf, Birsfelden, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

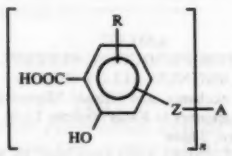
Filed Aug. 1, 1983, Ser. No. 519,419

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229513

Int. Cl.³ C25D 5/50

U.S. Cl. 148—6.27 **14 Claims**

1. A process for sealing an anodically oxidized aluminum or aluminum alloy surface which comprises sealing the surface in an aqueous bath containing, as an anti-smut agent, a colorless, light-fast organic compound of formula I



I

in which

R is hydrogen, —COOH or $—SO_3H$,

Z is —NH—, —CO—, $—SO_2—$ or $—CH_2)_m$ where m is an integer from 1–6,

A is an n-valent organic bridging group and n is an integer from 1–8,

with the provisos that said compound has a molecular weight of at least 350 and contains at least one sulphonic acid group and, where $n>1$, each R and each Z respectively, may have the same or different significance and the same or different location on the benzene ring.

4,531,980

CORROSION RESISTING COPPER ALLOY

Tatsuo Miura, Kariya; Kazuhiro Ohta, Nagoya; Yoshiharu Hasegawa, Ohbu, and Takao Yoneyama, Kariya, all of Japan, assignors to Granges Metallverken AB, Västerås, Sweden

PCT No. PCT/EP80/00106, § 371 Date May 27, 1981, § 102(e) Date May 27, 1981, PCT Pub. No. WO81/00860, PCT Pub. Date Apr. 2, 1981

Continuation-in-part of Ser. No. 269,027, May 27, 1981, abandoned. This PCT application Sep. 29, 1980, Ser. No. 546,074

Int. Cl.³ C22F 1/08

U.S. Cl. 148—11.5 C **13 Claims**

1. A method of producing a copper alloy exhibiting corrosion resisting properties, said alloy consisting essentially of 25 to 38 percent zinc by weight of the alloy, 0.005 to 0.04 percent phosphorus by weight of said alloy, the balance of said alloy being copper, comprising the steps of

preparing said alloy in the form of an element having a small cross-section to permit rapid heating thereof;

heating said alloy to a temperature of between 450 and 600 degrees for a period of time between 5 seconds and 5 minutes to recrystallize grain size and maintain the phosphorus in a substantially uniform solid solution; and

cooling said alloy, said alloy being recrystallized with a grain size of between 2 and 10 microns and having a depth of corrosion after a 30 day salt water test which is not greater than 34 microns.

6. A heat exchanger which comprises a plurality of tubes in which a heat exchanging medium may flow and which are composed of a copper alloy exhibiting corrosion resisting properties, said alloy consisting essentially of 25 to 38 percent zinc by weight of said alloy, 0.005% to 0.04 percent phosphorus by weight of said alloy, the balance of said alloy being copper, the recrystallized grain size of said alloy being within the range of 2μ to 10μ inclusive, the phosphorus being in a substantially uniform solid solution within the grain of the alloy and the alloy having a depth of corrosion after a 30 day salt water test which is not greater than 34μ.

4,531,981

COMPONENT POSSESSING HIGH RESISTANCE TO CORROSION AND OXIDATION, COMPOSED OF A DISPERSION-HARDENED SUPERALLOY, AND PROCESS FOR ITS MANUFACTURE

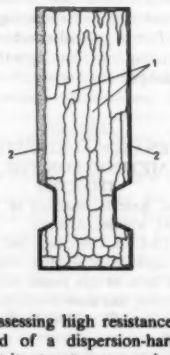
Robert Singer, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 1, 1984, Ser. No. 575,950

Claims priority, application European Pat. Off., Feb. 1, 1983, 83200173.9

Int. Cl.³ C22F 1/10

U.S. Cl. 148—11.5 N **15 Claims**



1. Component possessing high resistance to corrosion and oxidation, composed of a dispersion-hardened superalloy, characterized in that its structure comprises a coarse-grained core (1), in which the average crystallite size ranges from 0.2 to

50 mm in the longitudinal axis, and from 0.1 to 10 mm in the transverse axis, and a fine-grained skin zone (2) which is 20 to 2000μ thick, has an average crystallite size ranging from 0.1 to 5μ, and forms a case.

4,531,982

SUPERCONDUCTOR MANUFACTURING PROCESS

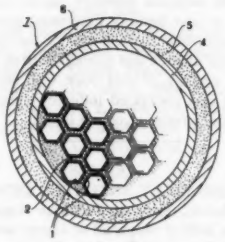
Patrick Dubots, Neauphle le Chateau, France, assignor to Alsthom-Atlantique, S.A., Paris, France

Filed Mar. 9, 1984, Ser. No. 588,053

Claims priority, application France, Mar. 16, 1983, 83 04284

Int. Cl.³ H01L *39/00*

U.S. Cl. 148—11.5 F **28 Claims**



1. A process for manufacturing a superconductor, the process having the following sequential steps:

(a) placing a bar of a first metal in a matrix of at least a second and a third metal material, said second metal material being capable of combining, when heated, with the first metal to form a superconductor;

(b) working the bar and matrix together to form a rod having a hexagonal cross section;

(c) packing a plurality of said rods into a bronze tube;

(d) repeatedly drawing the assembly of the preceding step to form a multifilament strand having a reduced cross section and increased length;

(e) arranging the multifilament strand into a desired configuration;

(f) heating the strand in the desired configuration to a temperature at which the first metal combines with the second metal material to form a superconductor, wherein the improvement comprises:

between steps (c) and (d) surrounding said bronze tube with a resistive tube and

disposing between the bronze tube and the resistive tube an electrically insulating refractory powder that is not soluble in the material of either tube.

4,531,983

METHOD OF DEEP HARDENING OF WORKPIECES

Franz Overkott, Gevelsberg, Fed. Rep. of Germany, assignor to Firma Paul Ferd. Peddinghaus, Gevelsberg, Fed. Rep. of Germany

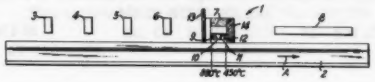
Continuation of Ser. No. 182,136, Aug. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,773, Sep. 25, 1979, abandoned, which is a continuation of Ser. No. 804,431, Jun. 7, 1977, abandoned. This application Jul. 15, 1983, Ser. No. 514,353

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627791; Oct. 9, 1979, 2940826

Int. Cl.³ C21D *1/74*

U.S. Cl. 148—16 **9 Claims**

1. In a method of deep hardening of metal workpieces which must absorb specifically high surface pressures in use wherein the workpiece is initially heated to the austenitizing temperature and is subsequently quenched, the improvement which comprises initially quenching the workpiece with a quenching medium to a range above the martensitic limit and maintaining the temperature in this range with a controlled cooling medium until the transformation of the structure to a fine particulate sorbite has been substantially completed and then further cooling the workpiece, wherein the temperature of the cooling



medium is controlled by admixing a cooling agent therewith and uncooled compressed gas is used as the cooling medium and cooled gas is used as the cooling agent.

4,531,984

SURFACE HARDENING PROCESS FOR METAL PARTS

Michel Madsac, Sceaux, and Thierry Hiron, Le Plessis Robinson, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 17, 1983, Ser. No. 476,369

Claims priority, application France, Mar. 23, 1982, 82 04874

Int. Cl.³ C21D *1/00*; C23C *11/14*

U.S. Cl. 148—16.6 **14 Claims**

1. In a process for the surface treatment of iron-containing metal parts by nitriding, including the steps of placing the parts in a furnace and maintaining the parts in the furnace at a temperature between substantially 490° C. and 750° C. in an atmosphere formed by introducing into said furnace a gaseous mixture comprising ammonia and catalytic gaseous compound means for catalytically accelerating the dissociation of the ammonia in contact with said parts into nitrogen and hydrogen, with the gaseous compound means including an oxidizing gas; the improvement wherein said oxidizing gas is nitrous oxide, and said gaseous mixture contains substantially 0.1% to 10% by volume of said nitrous oxide.

4,531,985

SURFACE TREATMENT OF METAL RINGS

Norman Tommis, Bradford, England, assignor to AE PLC, Rugby, England

Filed Dec. 13, 1982, Ser. No. 449,205

Claims priority, application United Kingdom, Dec. 16, 1981, 8137940

Int. Cl.³ C21D *9/40*; C23C *11/14*

U.S. Cl. 148—16.6 **4 Claims**

1. A process for treating piston rings, each ring having upper and lower radially extending side surfaces and a radially outer surface between said side surfaces, the process comprising the steps of

forming the rings from a ferrous material,

forming a plurality of the rings into a stack with the side surfaces of adjacent stacked rings in contact,

placing the stack of rings in a chamber,

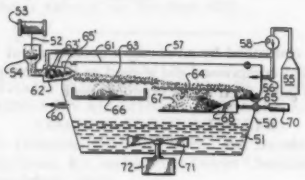
supplying to the chamber a gaseous mixitre of an exothermic hydrocarbon gas and ammonia gas in the ratio of 40:60 (by volume) at a temperature of 550° C. to 570° C. to nitrocarburise the outer surface and the side surface of the rings to a depth of from 0.1 mm to 0.3 mm in a single treatment step,

continuing the treatement for a time of from 2 to 3 hours and then removing the stack of rings from the chamber and separating the treated rings to provide individual rings having a hard "ξ" layer both on the outer surface and on the side surfaces thereof.

4,531,986
SOLDER COMPOSITION

Felix Barajas, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 15, 1984, Ser. No. 662,394
Int. Cl.[3] B23K *35/34*
U.S. Cl. 148—24 26 Claims

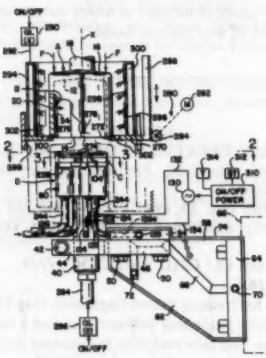


1. A solder composition especially adapted for high speed soldering of components in electronic circuitry, which comprises finely divided solder metal dispersed in a vehicle containing as solvent a low volatile high molecular weight alcohol, said vehicle being present in an amount of 10 to 14%, and said solder metal being present in an amount of 86 to 90%, by weight of said composition.

4,531,987
METHOD FOR INDUCTIVELY HEAT TREATING WORKPIECE BORE WALLS

George D. Pfaffmann, Farmington, Mich., and George M. Mucha, Parma Heights, Ohio, assignors to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed May 30, 1984, Ser. No. 615,225
Int. Cl.[3] C21D *1/18*
U.S. Cl. 148—150 11 Claims



1. A method of quench hardening to a selected depth the wall surface of an elongated bore of uniform cross-sectional shape throughout and extending axially within a metal workpiece and having an open end and a closed opposite end, said method comprising the steps of:

(a) supporting said workpiece with the axis of said bore extending vertically and said open bore end facing downward and located above and in vertical alignment with an inductor assembly axially passable through said bore and provided with inductor means located adjacent the top end of said assembly and having an outer shape generally matching the cross-sectional shape of said bore;

(b) initiating relative vertical movement at a selected rate between said supported workpiece and said inductor assembly, while energizing the said inductor means with a selected frequency and power level, to effect passage of said inductor assembly upwardly into and through said bore to a limiting innermost position therein contiguous the said closed end thereof and progressively inductively heat to a selected quenching temperature and depth the wall surface of said bore upwardly therealong from said open lower end thereof;

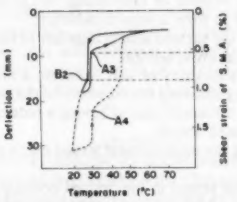
(c) conducting a primary quench operation comprising the directing of primary quench liquid progressively against said bore wall surface immediately as it is progressively heated upwardly by said energized inductor means to said quenching temperature to thereby progressively quench harden said heated bore wall upwardly; and,

(d) conducting a secondary quench operation comprising the directing of secondary quench liquid out of the top end of said inductor assembly, upon reaching and while stationed at said limiting innermost position within said bore, to overflow the top end of the inductor assembly and impinge against and quench harden the heated innermost end regions of said bore wall surface inductively heated by said energized inductor means but above the reach of said primary quench liquid.

4,531,988
THERMALLY ACTUATED DEVICES

Tsunehiko Todoroki, Kusatsu; Tadahiko Hayakumo, and Katsumi Fukuda, both of Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 11, 1984, Ser. No. 619,272
Claims priority, application Japan, Jun. 13, 1983, 58-105174
Int. Cl.[3] C22C *14/00, 19/03*
U.S. Cl. 148—402 4 Claims



1. A thermally actuated device comprising a shape memory alloy of Ti-Ni base alloy and a counteracting bias load combined together to provide a two-way action, the temperature-deflection relationship at an operating temperature range being such that the shear strain of the shape memory alloy corresponding to the point of transit from a first shape recovery process to a second shape recovery process resulting from the heating is smaller than that corresponding to the point of termination of a first strain induced process by the counteracting bias load resulting from the cooling, the difference between said two shear strains being restricted to the range of operating strain of the shape memory alloy.

4,531,989
AMINE BONDING AGENTS IN POLYESTER BINDERS

Marjorie E. Ducote, and Charles L. Greer, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 3, 1984, Ser. No. 596,345
Int. Cl.[3] C06B *45/10*
U.S. Cl. 149—19.2 11 Claims

1. A solid propellant composition employing a high-solids loading of about 67 parts of an ammonium oxidizer salt selected from ammonium perchlorate, ammonium nitrate, ammonium sulfate, and ammonium formate; a polyester binder system comprised of from about 22.29 to about 22.79 parts of the polyester polydiethyleneglycoladipate, a trifunctional polymer for crosslinking of about 3.72 parts of polycaprolactone, and a

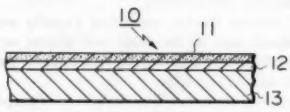
plasticizer of about 4.00 parts of dioctyladipate; a curing agent of isophorone diisocyanate of about 2.64 parts; a curing catalyst of triphenylbismuth and maleic anhydride of 0.015 parts each respectively; and a finely dispersed amine salt adduct of about 0.20 parts as a bonding agent that is insoluble in said polyester binder system, said finely dispersed amine salt bonding agent being an adduct of an ammonium salt selected from the ammonium salts consisting of ammonium perchlorate, ammonium nitrate, ammonium sulfate, and ammonium formate and an amine compound selected from the polyamine compounds consisting of cyanoethyl substituted tetraethylene pentamine and the glycidol reaction product of cyanoethyl substituted tetraethylene pentamine.

4,531,990

METHOD FOR PRODUCING A MAGNETIC TAPE

Kenzaburo Iijima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Division of Ser. No. 455,525, Jan. 4, 1984, Pat. No. 4,495,241.
This application Nov. 2, 1984, Ser. No. 667,859
Claims priority, application Japan, Jan. 6, 1982, 57-001256
Int. Cl.[3] H01F *10/02*
U.S. Cl. 156—60 **7 Claims**



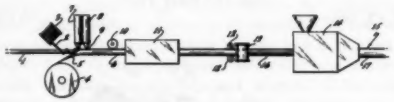
1. A method for producing a magnetic tape comprising
forming an elongated thin film from age-hardening type magnet alloy material,
subjecting said thin film to solution treatment, and
heating only one surface side of said film after said solution treatment while concurrently cooling the other surface side for age-hardening purposes.

4,531,991

HEAT-INSULATING TUBING

Gerhard Ziemek, Langenhagen, and Ingo H. Pahl, Hagen, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshuette A.G., Hanover, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,211
Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120179; Dec. 28, 1981, 3151578
Int. Cl.[3] B32B *5/18, 31/14*
U.S. Cl. 156—79 **11 Claims**



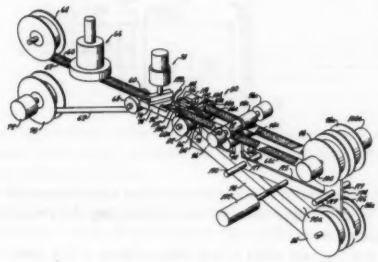
1. A method of thermally insulating a tube, comprising the steps of:
helically wrapping a spacer around the tube;
longitudinally folding a ribbon carrying a separating medium around and onto the helical spacer;
closing the ribbon along its edges to establish a closed tubular mold;
injecting a foaming material into the tube as it is being formed prior to closing, and permitting the material to foam inside the folded ribbon and tubular mold, and further permitting the foam to cure and set;
cutting and peeling the ribbon off the foam; and
extruding a thermoplastic, synthetic envelope onto the foam.

4,531,992

COMPOSITE TAPE PREPARATION AND APPLICATION

Homer L. Eaton, Leucadia, Calif., assignor to Vektronics, Inc., Carlsbad, Calif.

Division of Ser. No. 483,293, Apr. 8, 1983, Pat. No. 4,491,493.
This application May 7, 1984, Ser. No. 607,737
Int. Cl.[3] B32B *31/00*
U.S. Cl. 156—152 **21 Claims**



1. The method of preparing composite tape for use in the fabrication of a structural member formed of tape strips laid in side-by-side parallel rows, said method comprising
withdrawing a continuous length of tape from a tape supply station,
cutting the tape in consecutive strips, and
mounting the consecutive strips of cut tape on a carrier belt in longitudinally spaced relation to one another, said mounting step comprising intermittently driving the carrier belt at a rate greater than the rate of withdrawing said tape from said tape supply station.

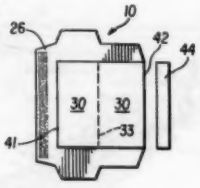
7. The method of preparing composite tape for use in the fabrication of a structural member formed of tape strips laid in side-by-side parallel rows, said method comprising
withdrawing tape from a tape supply station,
cutting the tape in consecutive strips, and
mounting the consecutive strips of cut tape on a carrier belt in longitudinally spaced relation to one another, said mounting step comprising intermittently driving the carrier belt at a rate greater than the rate of withdrawing said tape from said tape supply station,
said step of mounting comprising the steps of mounting a first series of alternate strips of the cut tape upon a first carrier belt and mounting at least some of a second series of alternate strips upon a second carrier belt.

11. The method of preparing composite tape for use in the fabrication of a structural member formed of tape strips laid in side-by-side parallel rows, said method comprising
withdrawing tape from a tape supply station,
cutting the tape in consecutive strips, and
mounting the consecutive strips of cut tape on a carrier belt in longitudinally spaced relation to one another,
said steps of cutting and mounting comprising feeding the tape to a first carrier belt, cutting the tape to form a trailing edge of a first strip and a leading edge of a second strip, feeding said first strip to said first carrier belt, feeding the leading edge of said second strip to a second carrier belt, cutting the tape to form a trailing edge of the second strip and a leading edge of a third strip, and feeding the third strip to said first belt with its leading edge spaced from said trailing edge of said first strip.

4,531,993
HIGH SPEED METHOD OF MAKING ENVELOPES EACH WITH A DOUBLE FOLDED REMOVABLE ENCLOSURE

William P. Bradley, Hollidaysburg, Pa., assignor to Bedford Engineering Co., Armonk, N.Y.

Filed Jan. 26, 1984, Ser. No. 574,308
Int. Cl.³ B65B 63/04
U.S. Cl. 156—227 15 Claims



1. A method of forming an envelope with a separate enclosure from a single sheet of material having the progressively occurring steps of

a. folding said sheet a first time to form a first panel and a double layer of sheet material with said first panel being one of said layers;

b. folding said sheet a second time so that a triple layer of sheet material is formed with said first panel being the middle layer of said triple layer;

c. severing and removing a portion of said sheet after the second fold to form two separate pieces of sheet material;

d. simultaneously folding said two pieces of resulting sheet material to form an envelope having a removable enclosure.

4,531,994
PROCESS FOR PREPARING A THERMOFORMABLE LAMINATE STRUCTURE

James S. Holtrop, South Windsor, Conn., and Richard P. Maurer, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 553,594, Nov. 21, 1983, Pat. No. 4,476,183, and a continuation-in-part of Ser. No. 553,462, Nov. 21, 1983, Pat. No. 4,489,126. This application Sep. 4, 1984, Ser. No. 647,096
Int. Cl.³ B32B 5/18, 31/00
U.S. Cl. 156—307.3 11 Claims

1. A process for forming a moldable thermoformable laminate structure having polymer impregnated cloth adhered to at least one side of a sheet of thermoplastic foam comprising

(a) applying a polymer emulsion film to a surface of a sheet of thermoplastic foam;

(b) allowing the emulsion film to dry by evaporation of emulsion liquids;

(c) applying a cloth to the dry emulsion film;

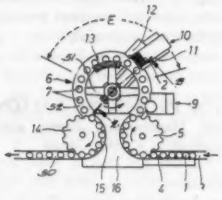
(d) impregnating the cloth with the polymer of the film by applying heat and pressure to the surface of the cloth whereby the polymer becomes plastic and impregnates the cloth;

(e) and adhering the cloth to the sheet of film of plastic foam by removing said heat and pressure from the surface of the cloth, thereby allowing the polymer to cool and solidify.

4,531,995
LABELING MACHINE FOR CONTAINERS

George Gau, Obertraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,727
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307662
Int. Cl.³ B65C 9/04
U.S. Cl. 156—456 7 Claims



1. A machine adapted for applying labels to containers having various diameters, comprising:

a rotationally driven table,

a label storage device supported radially away from the rotational axis of the table and means supporting said device for being adjusted along a circular path concentric to the axis of the table,

a plurality of container support plates arranged around the rotational axis of said table and rotatable about axes parallel to the axis of the table for transporting containers to said label storage device for the containers to effect withdrawal of a label,

cam follower means coupled to said plates, respectively, for being driven rotationally to thereby turn said plates and a container thereon,

stationary cam means for being engaged by said follower means to cause rotation thereof as said table rotates, the configuration of said stationary cam means being such that rotational speed of said follower means changes as the follower means move along said cam means, such that by adjusting said label storage device along said circular path a selected container rotational speed can be obtained when the container is in contact with a label.

4,531,996
SINGLE FACER CORRUGATING MACHINE

Robert J. Sukenik, Bloomfield Hills, Mich., assignor to Corrugating Roll Corporation, West Bloomfield, Mich.

Filed May 9, 1984, Ser. No. 608,466
Int. Cl.³ B31F 1/28
U.S. Cl. 156—472 85 Claims

1. A corrugating machine comprising a first corrugating roller assembly having a series of spaced corrugating segments which are nip loaded against and cooperative with a second

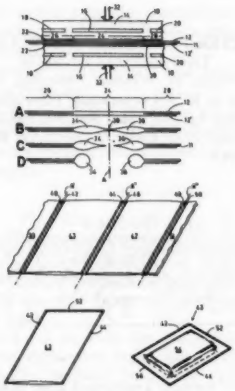
corrugating roller assembly for forming corrugations across the width of a paper medium as it passes between said first and second corrugating roller assemblies, and means for individually nip loading each of said corrugating segments which enables nip loads to be generated and varied in independent discrete segments spaced across the width of said medium.

4,531,997

FORMING BEAD SEAL IN BIAXIALLY ORIENTED POLYMER FILM BY HEAT BONDING

Orin B. Johnston, 16480 N. Hillcrest Ct., Eden Prairie, Minn. 55344

Filed Dec. 15, 1983, Ser. No. 561,684
Int. Cl.³ B32B *31/18, 31/20*
U.S. Cl. 156—498 **6 Claims**



1. In apparatus for heat sealing a selected segment of a web comprising at least two layers of biaxially oriented plastic film, said apparatus having means for pressing the layers of said web together, means for simultaneously heating said selected pressed segment to above bonding temperature, means for maintaining an adjacent pressed segment of said web below said bonding temperature, and means for cooling said selected segment sufficiently quickly to avoid degradation of the plastic, said means for pressing including pressing surfaces for pressing contact with said web the improvement wherein,

said pressing surfaces in pressing contact with the selected segment of said web subjected to heating to above bonding temperature have relatively lower surface friction than said pressing surfaces in pressing contact with said adjacent segment of said web, whereby the heated segment of said web is physically unrestrained by said surfaces against shrinkage during heating and is allowed to shrink back to its pre-oriented molecular configuration while said web in said adjacent segment is restrained against movement, thereby providing for formation of hermetic bead seal between said layers of said web in said selected segment.

4,531,998

ADJUSTABLE TAPE CHUTE FOR TAPE LAYING MACHINE

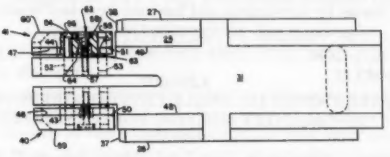
David A. Peterson, Milford, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 6, 1984, Ser. No. 597,547
Int. Cl.³ B65H *23/32*
U.S. Cl. 156—574 **5 Claims**

1. In a tape laying machine utilizing a tape head for laying composite tape strips on a laydown surface, said head movably carried on said machine with respect to said surface, an adjustable tape chute mounted on said head, comprising:

(a) a base member;

(b) first and second tape edge guides independently mounted to said base member on means for adjustably slipping said guides, each guide having a guide wall with said walls being oppositely disposed thereby forming a tape slot to guide opposite lateral sides of a tape strip;



(c) fine adjustment means for independently adjusting said guides with respect to said base member, said fine adjustment means including;

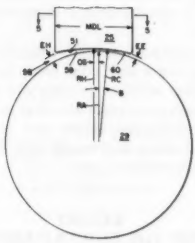
(d) solid shouldering means for positively maintaining said edge guides in respective adjusted positions limiting the maximum width of said formed tape slot.

4,531,999

DYNAMIC LAMINATING METHOD AND APPARATUS FOR ULTRASONICALLY BONDING JUXTAPOSED WEBS

Louis T. Persson, and Coenraad E. Riemersma, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 342,700, Jan. 26, 1982, Pat. No. 4,404,052.
This application Jun. 29, 1983, Ser. No. 509,272
Int. Cl.³ B29C *27/08*
U.S. Cl. 156—580.2 **11 Claims**



1. A laminating apparatus for dynamically converting a plurality of moving webs which are corporately subject to being ultrasonically bonded into a pattern-bonded laminate having ultrasonically bonded regions which apparatus comprises:

an ultrasonic horn having a horn-face, said horn-face being concave-shape in the machine direction;

an anvil cylinder having at least one cycle of a predetermined bond pattern defined in relief on its circumferentially extending surface by radially outwardly extending bond-pattern elements;

said horn-face and said anvil cylinder being so disposed and configured to define there-between an arcuate-shape, convergent portion which converges in the downstream direction and elongate arcuate-shape divergent portion disposed downstream from said convergent portion;

means for biasing said horn-face towards said anvil with a predetermined force;

means for ultrasonically powering said horn-face to cyclically move it along a path having a substantial component

disposed normal to the surface of said anvil cylinder and for effecting bonding of said bonded regions;

means for drivingly rotating said anvil cylinder about its axis to provide a predetermined circumferential velocity of said bond-pattern elements;

means for forwarding said plurality of webs into said bonding passageway at predetermined levels of tension and in velocity synchronized relation with said bond-pattern elements; and

means for forwarding said laminate from said bonding passageway at said predetermined velocity.

4,532,000

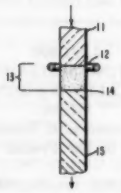
FABRICATION OF SINGLE CRYSTAL FIBERS FROM CONGRUENTLY MELTING POLYCRYSTALLINE FIBERS

James A. Harrington, West Lake Village; Antonio C. Pastor, Santa Monica; Arlie G. Standlee, Thousand Oaks, and Roger R. Turk, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 28, 1983, Ser. No. 536,596

Int. Cl.³ C30B *1/08*

U.S. Cl. 156—620 **12 Claims**



1. A method of producing a single crystal fiber capable of transmitting infrared radiation comprising:

(a) providing a polycrystalline congruently melting fiber; and

(b) converting said polycrystalline fiber to said single crystal fiber by creating a melt zone near one end of said polycrystalline fiber and then causing said melt zone to travel a length of said polycrystalline fiber at least once, so that said fiber continuously melts and recrystallizes into a single crystal along said length such that said length becomes one continuous crystal.

4,532,001

PROCESS FOR THE LIQUID PHASE EPITAXIAL DEPOSITION OF A MONOCRYSTALLINE TERNARY COMPOUND

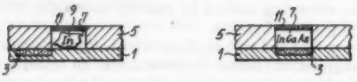
Jean-Louis Benchimol, 5, Rue Loredde, 75013 Paris, and Maurice Quillec, 17, Rue Emile Dubois, 75014 Paris, both of France

Filed Dec. 27, 1982, Ser. No. 452,920

Claims priority, application France, Dec. 28, 1981, 81 24291

Int. Cl.³ C30B *19/04*

U.S. Cl. 156—622 **10 Claims**



1. A process for liquid phase epitaxial deposition on a substrate of a ternary compound crystallizing in the same orientation as the substrate and complying with formula $A_xB_{n-x}C_m$ in which A, B and C are elements of the periodic classification of elements, n and m are natural numbers, which can be the same or different, and x is between 0 and n, comprising the steps of:

(a) preparing a liquid epitaxy bath containing an excess of the binary stoichiometric compound of formula B_nC_m in a solid monocrystalline oriented state and having molar concentrations of elements B and C such that the relation of the molar concentration of B to the molar concentration of C is equal to n/m, the bath being prepared by heating element A of the ternary compound and an excess of the solid compound B_nC_m at a temperature such that there is formed a liquid phase with a composition corresponding to the equilibrium with the solid phase $A_xB_{n-x}C_m$ and an excess of the binary compound B_nC_m in the solid state;

(b) contacting the bath with the substrate to be coated; and

(c) depositing thereon the ternary compound $A_xB_{n-x}C_m$.

4,532,002

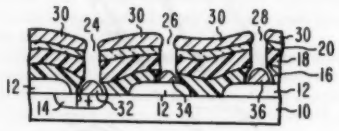
MULTILAYER PLANARIZING STRUCTURE FOR LIFT-OFF TECHNIQUE

Lawrence K. White, W. Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 10, 1984, Ser. No. 598,745

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*

U.S. Cl. 156—643 **12 Claims**



1. A method of forming a patterned layer of metallization on a substrate having topographical features which comprises:

(a) spin-coating on the substrate a layer of a polymeric lift-off material and, thereover, a layer of a polymeric planarizing material, wherein the dry etch rate of the lift-off layer is at least 1.2 times faster than that of the planarizing layer;

(b) dry etching said layers selectively to form openings therethrough, the openings having a reverse slope wall profile as a result of the difference in etch rates of said layers;

(c) depositing a layer of metallization over the resulting structure, the reverse slope wall profile causing the metallization deposited in said openings to separate from that overlying said planarizing layer;

(d) contacting the resulting structure with an organic solvent to separate the lift-off layer from the substrate; and

(e) removing said structure from the substrate.

4,532,003

METHOD OF FABRICATION BIPOLAR TRANSISTOR WITH IMPROVED BASE COLLECTOR BREAKDOWN VOLTAGE AND COLLECTOR SERIES RESISTANCE

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 9, 1982, Ser. No. 406,333

Int. Cl.³ H01L *21/306, 7/44, 29/72, 7/00*

U.S. Cl. 156—648 **24 Claims**

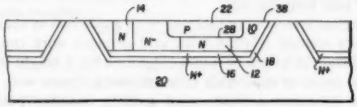
1. A method of fabricating a vertical bipolar transistor comprising:

simultaneously forming in a substrate of a first conductivity type a first and second selective region of said first conductivity type extending from the bottom toward the top surface of said substrate and having an impurity concentration greater than said substrate;

forming in the bottom of said substrate a buried region of

said first conductivity type and having an impurity concentration greater than said substrate;

forming a base region of a second conductivity type opposite said first conductivity in said substrate over said first selective region, said base region having a greater lateral area than said first selective region to form a buried junction therewith, the impurity concentration of said first selective region at said buried junction being sufficiently



greater than said first impurity concentration of said substrate to produce a plane breakdown voltage equivalent to the planar breakdown voltage;

forming an emitter region in said base region of said first conductivity type; and

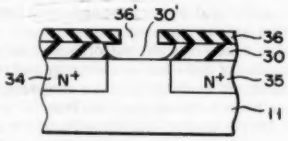
forming a collector contact region in the surface of said second selective region of said first conductivity type and having an impurity concentration greater than said second selective region.

4,532,004

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Tatsuo Akiyama, Tokyo; Yutaka Koshino, Yokosuka, and Shunichi Hiraki, Hyogo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 31, 1984, Ser. No. 636,221
Claims priority, application Japan, Aug. 1, 1983, 58-140872
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—653 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

forming an insulating protection film on a semiconductor substrate;

forming a dummy gate electrode on said protection film;

forming a distance setting film having a constant thickness on an exposed surface of said protection film and upper and side surfaces of said dummy gate electrode;

ion-implanting an impurity in said semiconductor substrate using said dummy gate electrode and regions of said distance setting film which are respectively formed on the upper and side surfaces of said dummy gate electrode as a mask so as to a form source and drain region, respectively;

etching said distance setting film;

forming an etching preventive film on an exposed surface of said protection film;

etching said dummy gate electrode using said etching preventive film formed on said protection film as a mask so as to form a first opening;

etching a region of said protection film corresponding to a region in which said dummy gate electrode was present so as to form a second opening thereby exposing a portion of said semiconductor substrate; and

forming a metal gate electrode to be in contact with said semiconductor substrate through said first and second openings.

4,532,005

DEVICE LITHOGRAPHY USING MULTI-LEVEL RESIST SYSTEMS

Michael J. Grieco, Gillette, N.J., and Laura P. Hale, Durham, N.C., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 21, 1984, Ser. No. 612,338
Int. Cl.³ G03C *5/00*; B44C *1/22*; C03C *15/00*; B05D *3/06*
U.S. Cl. 156—661.1 **11 Claims**

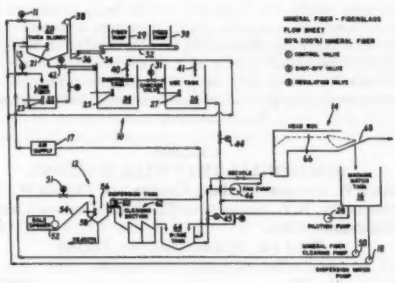
1. In a process for patterning a device wafer using a multi-level resist system having a bottom layer of novolac-type resist, the step of ramp heating the bottom resist layer for a time duration of between about 5 minutes and about 30 minutes, comprising subjecting the bottom resist layer to an initial ambient temperature of between about 150 degrees C. and about 180 degrees C. and thereafter to a final ambient temperature of between about 230 degrees C. and about 270 degrees C., whereby the bottom resist layer is subjected to ambient temperatures between about 150 degrees C. and about 180 degrees C. for at least one-quarter of the time duration.

4,532,006

INORGANIC FIBER MAT USING MINERAL WOOL AND RELATED PROCESS AND APPARATUS

Donald C. Winters, Irving, Tex., and Ivan D. Klein, Westford, N.Y., assignors to The Flintkote Company, Stamford, Conn.

Filed Aug. 5, 1983, Ser. No. 520,842
Int. Cl.³ C03B *37/00*
U.S. Cl. 162—3 **3 Claims**



1. A method for producing an improved inorganic fiber mat which comprises the steps of:

(a) forming an aqueous slurry of an inorganic fiber raw material, at least a portion of which is mineral wool, which raw material is only partially fibrous in form and contains non-fibrous, particulate contaminants including heavy, non-fibrous inorganic particulate material;

(b) agitating the said aqueous slurry under controlled agitation conditions so as to separate said heavy, non-fibrous inorganic particulate material;

(c) passing the previously agitated slurry through a cleaning system comprising a series of baffle chambers, wherein the moving slurry is cascaded and subjected to air-induced hydraulic turbulence, said air being injected into each chamber to create turbulence sufficient to separate the remaining non-fibrous, inorganic particulate contaminants from the inorganic fibers within said chambers; and

(d) thereafter transferring the said fibrous slurry to a mat forming device, on which said fibrous slurry is wet laid to form said mat.

4,532,007

USE OF SUBSTANCES GIVING OFF OXYGEN IN REDUCTION OF DARK COLORING OF PULP

Per-Olle Norén, Norrköping, Sweden, assignor to Holmens Bruk Aktiebolag, Norrköping, Sweden and L'Air Liquide S.A. pour l'Etude et Exploitation des Procedes Georges Claude, Paris, France

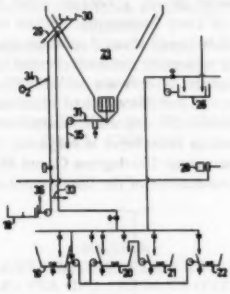
PCT No. PCT/SE82/00286, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. W083/01080, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 20, 1982, Ser. No. 498,199

Claims priority, application Sweden, Sep. 22, 1981, 8105591

Int. Cl.³ D21F *1/66*

U.S. Cl. 162—161 **3 Claims**



1. In the production of paper, a method of reducing discoloration of paper pulp in closed white water systems due to the presence of metal sulfides where the metal sulfides are produced by the reaction of metal ions present in the system with hydrogen sulfide, the hydrogen sulfide being produced under the influence of anaerobic microorganisms with sulfates, the method comprising maintaining aerobic conditions within said closed white water system at a redox potential higher than −100mV by introducing oxygen or oxygen-containing gases thereby inhibiting growth of said anaerobic microorganisms.

4,532,008

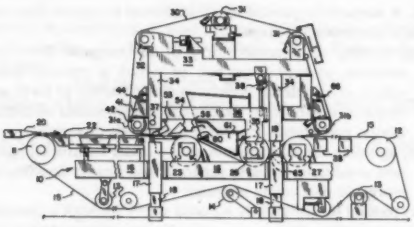
HORIZONTAL TWIN WIRE MACHINE

Richard W. Creagan, Kirkland, Canada, and Thomas W. Patell, Mannsville, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Filed Jul. 22, 1983, Ser. No. 516,069

Int. Cl.³ D21F *1/40, 1/00*

U.S. Cl. 162—203 **14 Claims**



1. In apparatus for forming paper, including a breast roll, a couch roll and associated wire guide rolls supporting a primary endless forming wire, the combination of:

(a) a forming roll positioned to receive a generally horizontal run of said forming wire from said breast roll,

(b) headbox means adjacent said breast roll for delivering a flow of paper making stock to said wire for drainage therethrough to form a paper sheet thereon while traveling thereon toward said forming roll,

(c) a plurality of guide rolls supporting a second endless forming wire above said primary wire,

(d) roll means positioned to guide a run of said second wire from one of said guide rolls into converging relation with said primary wire run on the surface of said forming roll with said convering wire runs defining a wedge zone therebetween and then wrapping a portion of the surface of said forming roll,

(e) means maintaining said one wire guide roll in such vertically spaced relation with said primary wire run that a substantial length of said wedge zone has a height less than the depth of said stock flow on said primary wire run,

(f) at least one primary wire guiding member positioned below and in supporting contact with said primary wire run along said wedge zone,

(g) at least one upper wire guiding member located within the loop of said second wire in supporting contact with said second wire run along said wedge zone and in offset relation lengthwise of said wedge zone with each said primary wire guiding member,

(h) each said wire guiding member being proportioned for contact with a minor area of said wire run supported thereby to expose a major unsupported area of each said run to the space on the opposite side of said run from said wedge zone for passage of liquid therethrough into said space,

(i) means between said headbox means and said wedge zone for controlling drainage through said primary wire to prevent formation of a sheet on said primary wire upstream from said wedge zone,

(j) means mounting each said upper wire guiding member in predetermined vertically spaced relation with each said primary wire guiding member wherein said wire guiding members support and maintain both of said wire runs against relative displacement by the stock therebetween in said wedge zone and thereby cause liquid to be expressed through said unsupported exposed areas of both of said wires throughout said wedge zone and cause formation of a paper sheet between said wires,

(k) said wedge zone being devoid of means for applying suction to either of said wire runs whereby said expression of liquid is effected by the progressive compression of said wedge zone by said converging wire runs,

(l) means within the loop of said second wire for receiving and removing liquid expressed therethrough from said wedge zone, and

(m) means located downstream from said forming roll in position to guide said second wire away from said primary wire and thereby to leave said newly formed sheet on said primary wire for travel thereon to said couch roll.

13. The process of forming a paper sheet on a primary endless wire in combination with an endless top wire which comprises the steps of:

a. delivering dilute paper making stock to a substantially horizontal run of said primary wire,

b. guiding a run of said top wire into converging relation with said primary wire run at a small angle to form a wedge zone between said runs having a mouth at the upstream end thereof,

c. guiding said converged wires into wrapping engaging with a forming roll at the downstream end of said wedge zone,

d. establishing the vertical dimension between said runs adjacent the mouth of said forming zone at a value less than the depth of the stock on said primary wire run at the mouth of said forming zone,

e. controlling drainage through said primary wire upstream from said wedge zone to prevent formation of a sheet on said primary wire in advance of said wedge zone,

f. applying positive pressure to at least one minor area of said primary wire from below and to at least one minor area of

said secondary wire from above at positions spaced from each other lengthwise of said wedge zone while leaving major areas of said wire runs unsupported and exposed to the spaces on the opposite surfaces thereof from said wedge zone and thereby causing liquid to be expressed through said unsupported and exposed areas into said spaces while avoiding the application of suction in said wedge zone to effect formation of a paper sheet between said wires in said wedge zone, and

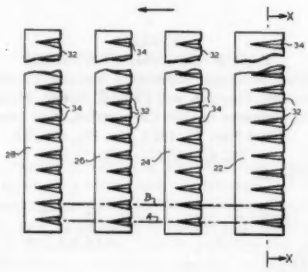
g. thereafter separating said top wire from said sheet on said primary wire.

4,532,009

FORMING BOARD ELEMENTS

Leslie F. Nickerson, Clifton Park, N.Y., assignor to Albany International, Menands, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,287
Int. Cl.³ D21F *1/00*; D21G *9/00*
U.S. Cl. 162—351 **14 Claims**



1. A continuous papermaking apparatus comprising

a forming fabric moving in a continuous loop;

means for depositing stock on the forming fabric comprising particles or fibers in suspension; and

forming board elements disposed transversally and successively under said fabric, each of said forming board elements having a top surface with a leading edge and a trailing edge in contact with said forming fabric and a leading side surface disposed transversally to the direction of movement of said fabric upstream of and generally at an acute angle to said top surface thereby draining water from said stock, and a plurality of notches extending from said leading side surface to a point between said leading and trailing edges on said top surface to force a portion of the drained water back into the stock;

whereby any flocs formed in said stock are dispersed in the transversal shear generated by said waves.

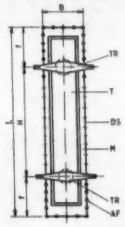
4,532,010

DOOR STRUCTURE FOR COKING OVENS

Heinz Dürsten, Essen; Winifried Faust, Mühlheim, and Rainer Schlösser, Essen, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,097
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307844
Int. Cl.³ C10B *25/06, 25/24*
U.S. Cl. 202—248 **2 Claims**

1. A coke oven door structure for use in coke ovens, comprising a door frame secured to the oven, a movable door body of a material having a continuous high elasticity of flexure and being exposable to temperature gradients of about 100 degrees Kelvin per meter, a sealing membrane arranged at the periphery of the door body and defining a sealing strip for contacting the door frame with a specific compression force q, and at least two head rails for applying locking force on the door body, the ratio of rigidity (E×I) of the door body to the specific compression force q applied through the sealing strip of the membrane being such as to compensate thermal deformations of the door body predominantly by the locking force of the head rails and by the compression force q applied to the sealing membrane, whereby E is the elasticity module of the material of the door body, I is moment of intertia of the door body, and wherein the ratio ExI/q is equal to or less than the expression



$$\frac{E \cdot I}{q} \leqq \frac{\alpha \cdot H^2 \left(2 + \frac{2 \cdot B}{L}\right)}{2.06 \cdot 10^{-7} \text{mm}^{-1}}$$

where

$$\alpha = \frac{5}{384} \cdot \frac{1 - 4.8 \cdot \frac{f^2}{H^2}}{1 + 2 \cdot \frac{f}{H}}$$

and wherein q is the the compression force between the sealing strip of the membrane and the door frame per length unit, H is the distance between the upper and lower head rails, f is the distance between the upper or lower head rail and the upper or lower end of the door, L is the total length of the door and B is the length of the sealing strip of the membrane over the door width.

4,532,011

INHIBITING POLYMERIZATION OF VINYLAROMATIC MONOMERS

Howard A. Colvin, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 2, 1984, Ser. No. 585,801
Int. Cl.³ B01D *3/34*; C07C *7/20*
U.S. Cl. 203—9 **7 Claims**

4. A process for inhibiting the formation of polymerized m or p-diisopropenylbenzene monomer during distillative purification of said monomer comprising distilling said monomer in the presence of zinc dialkyldithiocarbamate at a concentration of 10 to 3000 ppm, wherein the alkyl radical can be from 1 to 10 carbon atoms.

4,532,012

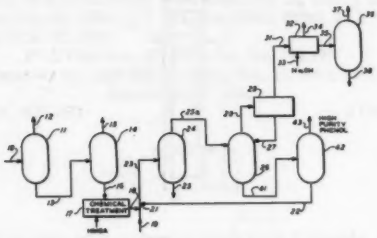
PRODUCTION OF HIGH PURITY PHENOL BY DISTILLATION WITH STEAM AND A SOLVENT

Ali M. Khonsari, Bloomfield, and George D. Suciu, Ridgewood, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Oct. 31, 1983, Ser. No. 547,077
Int. Cl.³ C07C *37/78*
U.S. Cl. 203—53 **12 Claims**

1. A process for producing high purity phenol, comprising: introducing phenol containing methylbenzofurans as an impu-

rity, water, and a water immiscible organic extraction solvent for methylbenzofurans into a steam distillation zone, said water being introduced in an amount to provide a water to phenol ratio of at least 0.05 to 1 and no greater than 0.8 to 1 and said extraction solvent being introduced in an amount to provide extraction solvent in an amount of at least 0.5% and no greater



than 10% all by weight of the phenol introduced into the steam distillation zone to reduce the quantity of phenol recovered as light product; and distilling the phenol in the steam distillation zone in the presence of the water and extraction solvent to recover a light product comprising phenol, water, extraction solvent and impurities, and a heavy product comprising phenol having a reduced quantity of impurities.

4,532,013

METHOD FOR MONITORING OPERATION OF A CURRENT-LIMITING TYPE GAS SENSOR

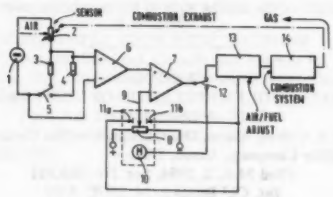
Hermann Dietz, Gerlingen; Ferdinand Grob, Besigheim; Klaus Müller, Tamm, and Harald Reber, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,622

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115404

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **11 Claims**



1. Method of monitoring the operation and calibration of a current-limiting type gas sensor (2) adapted for exposure to a combustion exhaust gas from a combustion system (14), which gas is to be tested for presence of a predetermined component thereof, and having an output connection to an evaluation circuit to translate the magnitude of the limit-current produced by said sensor into an output signal representative of the concentration of said predetermined component in the gas,

comprising the steps of

intermittently subjecting the sensor (2) to ambient air, by waiting a predetermined period of time after the last operation of said combustion system, sufficient to permit ambient air to penetrate the system and purge said system of residual combustion gases, then measuring the then-obtaining output of the sensor;

providing a standard reference value representative of sensor output when subjected to said ambient air;

comparing the measured limit-current output from the sensor, while subjected to ambient air, with such standard reference value;

obtaining a deviation signal if the measured limit-current output and the standard reference value do not agree;

determining whether the magnitude of said deviation signal exceeds a present value and, if not, storing said measured limit-current output as an updated one of a plurality of sensor operating point reference values;

deriving from said plurality of stored operating point values a standard sensor operating characteristic curve or function; and

extrapolating the sensor characteristic curve or function beyond the values from which said curve or function was derived.

4,532,014

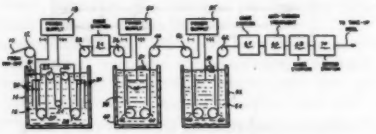
LASER ALIGNMENT SYSTEM

Ned W. Polan, Madison; Raymond J. Smialek, Cheshire; Arvind Parthasarathi, Hamden, and Peter E. Sevier, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,235

Int. Cl.³ C25D *5/04, 17/00*

U.S. Cl. 204—28 **18 Claims**



1. A system for aligning a plurality of rollers in a metal or metal alloy foil production line, said system comprising:

a reference frame having a longitudinal dimension parallel to the direction of travel of the foil through said foil production line; and

means mounted to said frame for optically aligning the rotational axis of each said roller in a first plane transverse to said longitudinal dimension and for optically aligning each roller in a second plane parallel to said longitudinal dimension and perpendicular to said first plane.

4,532,015

POLY(ARYLENE SULFIDE) PRINTED CIRCUIT BOARDS

Harold D. Boultinghouse; Paul J. Boeke; Robert E. Benefield, Jr., and John Leland, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 20, 1982, Ser. No. 409,792

Int. Cl.³ C23C *3/02*

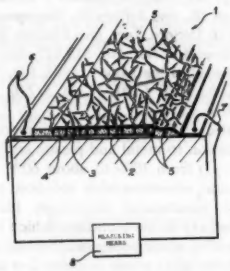
U.S. Cl. 204—38.4 **34 Claims**

1. A method for obtaining improved adhesion between a conductive metal and a poly(arylene sulfide) substrate comprising (a) depositing said conductive metal onto said poly(arylene sulfide) substrate by electroless plating, and (b) aging the plated substrate produced in (a) for a time sufficient for the adhesion between said conductive metal and said poly(arylene sulfide) substrate as tested by peel strength immediately after the electroless plating to improve significantly.

4,532,016
CAPACITIVE HYGROMETER AND ITS PRODUCTION PROCESS

Bernard Chambaz, Seyssins; Gilles Delapierre, Seyssinet, and Louis Destannes, Eybens, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 281,603, Jul. 9, 1981, Pat. No. 4,438,480.
This application Dec. 27, 1983, Ser. No. 565,625
Claims priority, application France, Jul. 9, 1980, 80 15263
Int. Cl.[3] H01G 7/00
U.S. Cl. 204—38.3 5 Claims

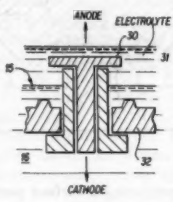


1. A process for producing a capacitive hygrometer constituted by a layer of dielectric material between two conductive faces wherein on the said dielectric material is deposited a first conductive face comprising a conductive material having stresses such that fissures are produced in the first conductive face and in the dielectric material so as to bring said dielectric material into contact with the atmosphere.

4,532,017
FLOATING CATHODE ELEMENTS BASED ON ELECTRICALLY CONDUCTIVE REFRACTORY MATERIAL, FOR THE PRODUCTION OF ALUMINUM BY ELECTROLYSIS

Maurice Keinborg, St Jean de Maurienne; Philippe Varin, Paris; Yves Bertaud, and Michel Leroy, both of St Jean de Maurienne, all of France, assignors to Aluminium Pechiney, Lyons, France

Filed Dec. 3, 1982, Ser. No. 446,626
Claims priority, application France, Dec. 11, 1981, 81 23780
Int. Cl.[3] C25C 3/06, 3/08; C25B 11/12
U.S. Cl. 204—67 20 Claims

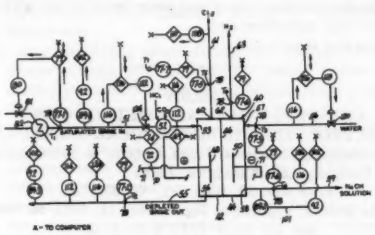


7. In a process of manufacturing aluminum by the Hall-Heroult process employing a molten cryolite-base bath as electrolyte, the improvement comprising a cathodic element of an electrically conductive refractory material as the active cathodic material which floats at the electrolyte-aluminum interface.

4,532,018
CHLOR-ALKALI CELL CONTROL SYSTEM BASED ON MASS FLOW ANALYSIS

David B. Wright; Richard W. Ralston, Jr., and James M. Ford, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 6, 1983, Ser. No. 529,309
Int. Cl.[3] C25B 15/02, 1/26
U.S. Cl. 204—98 8 Claims



1. A method for controlling the operation of a chlor-alkali cell, said cell comprised of anolyte compartment having an anode therein and a catholyte compartment having a cathode therein, said compartments being sealingly separated by a permselective membrane mounted therebetween, said cell receiving process streams comprising an alkali metal halogen salt brine in said anolyte compartment and water in said catholyte compartment, said cell acting under the stimulus of an electric current passing from said anode to said cathode to cause positive ions of said alkali metal to pass through said membrane to form an alkali metal caustic solution and hydrogen in said catholyte compartment and depleted brine and free halogen in said anolyte compartment as product streams eminating therefrom, said cell further comprising sensor means adapted to monitor the parameters comprising temperatures, compositions and flow rates of said process and product streams, control means adapted to control said parameters and a central control unit integrated with said sensor means and said control means, said control method comprising the steps of:

a. determining a value representative of a target product set point for output water loss, said loss being the total of the concentration of water in the alkali metal caustic product output stream, the flow rate of said output stream and the water lost at said cathode by the electrolytic reaction forming free hydrogen gas and hydroxyl ions in said catholyte compartment, said value being identified as $W_{caustic}$;

b. determining a value representative of the mass of water passing from said anolyte compartment to said catholyte compartment during electrolysis as determined by the water transport properties of said membrane, said mass being a composite function of anolyte brine concentration, caustic concentration, cell current and cell temperature and being identified as $W_{membrane}$;

c. determining a value representative of the mass of water leaving said catholyte compartment in said hydrogen product stream, said mass being the product of the humidity and flow rate of said hydrogen product stream and being identified as W_{H2};

d. utilizing the values determined in steps a. to c. to calculate a target value representative of the required mass flow rate for the water input process stream, said stream being identified as W_{in} as calculated by the equation:

$$W_{in} = W_{caustic} + W_{H2} - W_{membrane};$$

e. measuring the actual mass flow rate of water entering the system;

f. comparing said calculated target water mass flow rate with said actual flow rate to generate an error signal representative of the difference between the two;

g. when the magnitude of said error signal is outside the predetermined tolerance band therefore recomputing a new value of $W_{membrane}$, said recomputed value being based on said error signal magnitude, said recomputed value being used to generate a control signal to adjust said actual water mass flow rate so as to reduce said error signal magnitude;

h. transporting said control signal to a flow rate controller for said water input stream;

i. adjusting the flow rate of said water input stream with said flow rate controller; and

j. repeating steps c. to i.

4,532,019

GRINDING WHEEL AND METHOD FOR ELECTROLYTIC AND MECHANICAL GRINDING

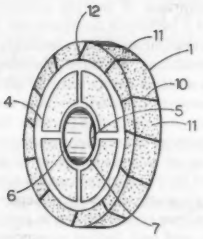
Akio Kuromatsu, Yokohama, Japan, assignor to Nicco Machine Tool Company Ltd., Kanagawa, Japan

Filed Apr. 30, 1982, Ser. No. 373,720

Claims priority, application Japan, May 21, 1981, 56-75690

Int. Cl.³ B23P *1/10, 1/00, 1/12*

U.S. Cl. 204—129.46 **17 Claims**



17. A method of grinding a workpiece comprising:

mounting a grinding wheel having a circular circumferential rim and a plurality of electrically conductive zones and non-conductive grinding zones therebetween around the rim on a grinding machine, each zone extending entirely across an axial width of the rim,

applying electricity to the conductive zones, and

simultaneously spinning the wheel and spraying an electrolytic fluid on the wheel while applying the workpiece to the wheel thereby performing alternating mechanical and electrolytic grinding.

4,532,020

PROCESS FOR PREPARING A β-(FLUOROALKYL OR FLUOROALKENYL)-β-HYDROXYALKYNE

Nobuo Ishikawa, Yokohama, and Tomoya Kitazume, Tokyo, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

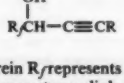
Filed Mar. 7, 1984, Ser. No. 586,943

Claims priority, application Japan, Mar. 9, 1983, 58-38784; Mar. 9, 1983, 58-38785

Int. Cl.³ B01J *19/10*

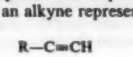
U.S. Cl. 204—158 HA **5 Claims**

1. A process for preparing a β-(fluoroalkyl or fluoroalkenyl)-β-hydroxyalkyne represented by the formula



$$R_fCH(OH)-C\equiv CR \quad (I)$$

wherein R_f represents a fluoroalkyl or fluoroalkenyl group and R represents an aliphatic or aromatic group, comprising reacting an alkyne represented by the formula



$$R-C\equiv CH \quad (II)$$

wherein R is the same as defined above with a fluorine containing aldehyde represented by the formula

$$R_fCHO \quad (III)$$

wherein R_f is the same as defined above in the presence of catalyst under ultrasonic irradiation.

4,532,021

ADHERENT ULTRAVIOLET CURED COATINGS

Edward J. Murphy, Mt. Prospect; Ronald J. Lewarchik, Arlington Hgts., both of Ill., and Jeffrey W. Thompson, Centerville, Ohio, assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 515,027, Jul. 18, 1983, abandoned. This application May 7, 1984, Ser. No. 606,527

Int. Cl.³ C08J *3/28*; C08L *31/08, 31/10, 31/12*

U.S. Cl. 204—159.16 **15 Claims**

1. An ultraviolet-curable liquid coating composition exhibiting improved adhesion to metal and plastic surfaces comprising, in admixture: (1) from 10% to about 60% of total resin solids of an organic solvent-soluble solution copolymer of monoethylenically unsaturated monomers including from 2.5% to 10% of tertiary amine monomer which is an aminoalkyl ester or amide of an alpha,beta-monethylenic monocarboxylic acid in which the alkyl group contains 2–4 carbon atoms, the balance of the copolymer, except for the amine monomer, being constituted by monomers having no reactive group other than the single ethylenic group, at least 40% of said copolymer being copolymerized methyl methacrylate and at least 15% of the copolymer being copolymerized C_2–C_{12} alkyl ester of acrylic or methacrylic acid; and (2) from 40% to 90% of total resin solids of radiation-curable ethylenically unsaturated liquid, said coating composition including photoinitiators and/or photosensitizers rendering the composition sensitive to ultraviolet light, and said components being present in solution in at least about 25% of inert volatile organic solvent in which the solvent content of said solution contains at least 30% of a C_1–C_4 alkanol.

4,532,022

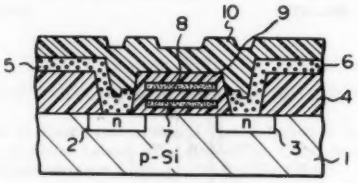
PROCESS OF PRODUCING A SEMICONDUCTOR DEVICE

Kanetake Takasaki, Tokyo; Mikio Takagi, Kawasaki, and Kenji Koyama, Yokosuka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 186,666, Sep. 12, 1980, abandoned. This application May 31, 1983, Ser. No. 499,477

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 D **10 Claims**



1. A process for producing a surface passivation film on a semiconductor device comprising a semiconductor substrate, at least one element selected from the class consisting of active and passive elements formed on or in said semiconductor substrate, a first insulating film located on said semiconductor substrate, and electrodes of at least one element disposed on said substrate, said process comprising:

subjecting said device to a chemical vapor deposition step in which monosilane is used as a feed gas, ammonia (NH_3) is

used as a source of nitrogen and nitrous oxide (N_2O) is used as a source of oxygen, and wherein the ratio of N_2O to NH_3+N_2O is in a range of from about 0.1 to about 0.5, and

said passivation film being formed on said substrate and covering said at least one element, said first insulating film, and said electrodes.

4,532,023

ELECTROCHEMICAL GAS ANALYZER FOR DETERMINATION OF SULPHUR DIOXIDE CONTENT OF GASES

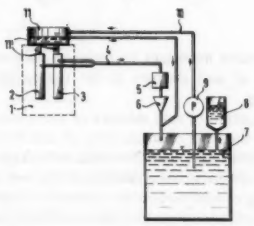
Leander Fürst, and Jiri Divisek, both of Julich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,431

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308888; Mar. 12, 1983, 8307201[U]

Int. Cl.³ G01N *27/50*

U.S. Cl. 204—402 **3 Claims**



1. An apparatus for polarographic analysis of sulphur dioxide in gases by measurement of the anodic oxidation current due to said sulphur dioxide comprising:

(a) a housing having a first and a second tubular chamber and upper and lower connecting means for interconnecting said chambers at their upper and lower portions respectively,

said second chamber being formed by a substantially vertical shaft in a log or block and said first chamber being formed by an other shaft oriented at an acute angle to the axis of said second chamber,

(b) a measuring electrode witin said second chamber,

(c) a non-polarizable counter-electrode within said second chamber spaced apart from said measuring electrode so as to permit electrolyte to be placed therebetween;

a gas inlet tube having an entrance and, within said first chamber, having an opening proximate to the bottom part of said chamber for the introduction of gas to be analyzed into said chamber when said housing is filled with electrolyte, the difference of the density of the electrolyte containing gas bubbles in said first chamber and the no-gas-bubbles containing electrolyte in the second one being capable of creating a circulation of gas saturated electrolyte in the housing when said housing is charged with electrolyte,

(e) means for connecting a source of electrical potential across said electrodes,

(f) means for measuring the current flowing between said electrodes when the device is charged with electrolyte, gas passed thereinto and potential applied across the electrodes,

(g) inflow and outflow means for the continued supply of fresh electrolyte to said chamber,

the inflow means for the fresh electrolyte being located to discharge into said upper connecting means, and

comprises a constant level storage tank positioned above the said upper connecting means; and

a capilliary tube journaled thru the base of said storage tank, the upper end thereof being below the liquid level in said container and the lower end thereof within said upper connecting means,

(h) cartridge means charged with activated charcoal, said charcoal having grains of sufficient size to permit simultaneous wetting thereof by said electrolyte and penetration of air therebetween, comprising an inflow means, an outflow means and an air access means; said flow means being connected to the outflow means from said chambers,

(i) electrolyte inflow control means, connected to the outflow means to said chambers, having inflow and outflow means, and

(j) outer circulating means connected between the outflow means of said cartridge and the inflow means of said electrolyte control means for circulating electrolyte therebetween,

the electrolyte inflow control means (i) being conceived for a constant electrolyte supply corresponding to an electrolyte exchange in the cell in the range of 0.5 to 5 of total cell volume per minute, and

the cartridge size and arrangement of its inflow and outflow means being thus adapted to the electrolyte exchange per minute that the activated charcoal is at least partially merely wetted by the electrolyte passing the cartridge.

4,532,024

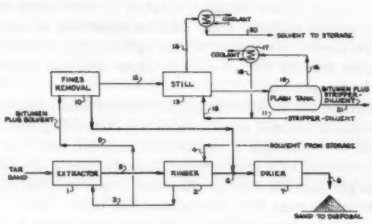
PROCESS FOR RECOVERY OF SOLVENT FROM TAR SAND BITUMEN

Elliot M. Haschke; Gerald A. Gimber, both of Lake Jackson, Tex., and Kenneth O. Groves, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 3, 1984, Ser. No. 677,648

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **5 Claims**



1. A process for recovering bitumen from tar sands which comprises:

(1) extracting bitumen from tar sand by mixing in co-current flow the tar sand with chlorinated hydrocarbons which may contain bitumen,

(2) withdrawing from said extracting step a chlorinated hydrocarbons bitumen extract containing from about 20 to 50 weight percent bitumen,

(3) rinsing in a counter current manner the extracted tar sand with chlorinated hydrocarbons to remove residual bitumen and forwarding a portion of said rinse composition to step 1,

(4) drying the sand from step 3 in a heated steam purged drying zone,

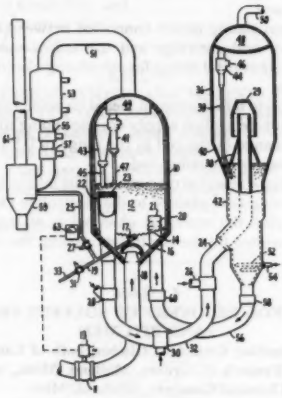
(5) recovering the solvent vaporized in step 4 and returning it to the process,

(6) recovering the extracting solvent from the solvent bitumen extractor by treating the extract of step 2 to remove sand fines, distilling the major portion of the solvent, and then mixing the resulting bitumen containing a small portion of the solvent with a higher boiling hydrocarbon while removing the chlorinated hydrocarbon thereby to obtain a bitumen substantially free of chlorinated hydrocarbon but containing sufficient hydrocarbon to be pumpable.

4,532,025
METHOD OF CONTROLLING CATALYST REGENERATION FOR FLUID CATALYTIC CRACKING TO MINIMIZE CATALYST BACKFLOW ABRASION

William C. Nielsen, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 8, 1984, Ser. No. 618,508
Int. Cl.[3] B01J *29/38*; C10G *11/18*
U.S. Cl. 205—113 8 Claims



1. In a fluid catalytic cracking process wherein catalyst is continuously regenerated in a regenerator vessel by forcing air flow through a bed of spent catalyst in said vessel to burn carbonaceous material from such catalyst and to heat such catalyst thereby for contact with a hydrocarbon feed stream in a reactor transfer line or riser to cause catalytic cracking of such hydrocarbons,

a method for optimizing combustion of said carbonaceous material on said spent catalyst by controlling the rate of air flow through a bed of said catalyst, said bed being supported by a grid having openings therein substantially larger than the average diameter of said catalyst particles to assure even flow throughout said bed,

wherein the improvement comprises positioning a catalyst collector below a lower portion of said grid to receive catalyst particles that may fall through said portion of said grid under low air flow conditions, withdrawing a portion of the air flowing to said bed of catalyst through said collector to detect the presence of catalyst therein and adjusting the flow rate of air through said grid to maintain a flow rate thereto adequate to avoid backflow of catalyst particles through said grid openings into said collector.

4,532,026
METHOD TO IMPROVE CIRCULATION CONTROL IN FLUIDIZED SYSTEMS

Bernard A. Fries, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 6, 1982, Ser. No. 395,865
Int. Cl.[3] C01G *11/18*, *35/14*
U.S. Cl. 208—164 9 Claims

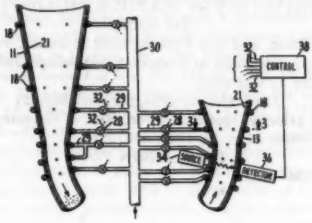
1. A method of controlling fluidization of a particulate material flowing through a fluid conduit, wherein the composition and flow rate of the fluidized mixture of said particulate material in an aerating gas is maintained by introducing aerating gas into said conduit at a plurality of spaced apart locations long said conduit, which comprises

positioning a penetrating source of electromagnetic radiation adjacent to said conduit wall to irradiate said fluidized mixture of said particulate material and said gas in said conduit,

positioning a radiation detector to intercept radiation from said source after partial absorption of said radiation by said fluidized mixture in said conduit,

monitoring the amount of radiation intercepted by said detector to thereby detect localized regions of inhomogeneity in the density of said mixture, and

controlling the flow of said aeration gas into said conduit at at least one of said spaced apart locations in an amount and



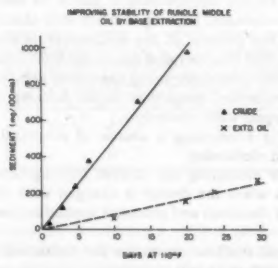
to an extent necessary to maintain substantially uniform density of said mixture in the region of said detector, whereby

the composition of said mixture of particulate material and gas and the flow characteristic of said flowing mixture in said conduit may be controlled, including maximum volume of said particulate material at a given density without slumping of said particulate material or without instability of flow and accompanying increased mechanical vibration of said conduit induced by formation and collapse of bubbles of gas in said mixture within said conduit.

4,532,027
METHOD FOR IMPROVING THE STABILITY OF SHALE OIL

John W. Frankenfeld, Atlantic Highlands, and Robert L. Bruncati, Hazlet, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1984, Ser. No. 567,565
Int. Cl.[3] C10G *19/02*, *31/06*
U.S. Cl. 208—255 5 Claims

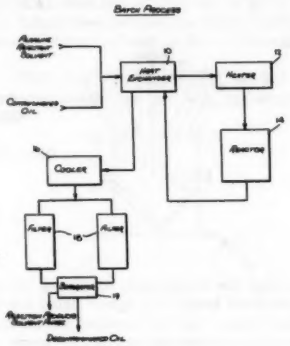


1. A method for improving the storage stability of shale oil liquid comprising extracting the shale oil liquid with an effective stabilizing amount of a base solution comprising shale oil retort process water having a pH of at least about 7.5 to inhibit the formation or reduce the level of sediment or gum formed.

4,532,028
METHOD FOR REDUCING CONTENT OF HALOGENATED AROMATICS IN HYDROCARBON SOLUTIONS

Robert L. Peterson, North Syracuse, N.Y., assignor to Niagara Mohawk Power Corporation, Syracuse, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,788
Int. Cl.³ C10G *17/00*
U.S. Cl. 208—262 11 Claims

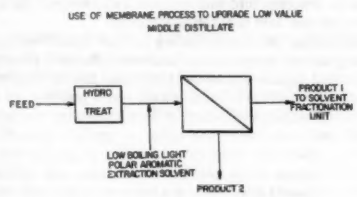


1. Method for reducing the content of halogenated aromatic hydrocarbons in a hydrocarbon solution which comprises heating under agitation a hydrocarbon solution having therein up to about 50,000 parts per million of said solution of halogenated aromatic hydrocarbon as a contaminant with a nonaqueous alkaline reactant in a sulfoxide solvent, said alkaline reactant selected from the group consisting of (i) an alkali metal alcoholate, (ii) a mixture of an alkali metal hydroxide and an alcohol or (iii) mixtures thereof.

4,532,029
AROMATIC SOLVENT UPGRADING USING MEMBRANES

Laura E. Black; Peter G. Miasek, both of Sarnia, Canada, and Georges Adriaens, Schilde, Belgium, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 27, 1984, Ser. No. 603,031
Int. Cl.³ C07C *7/144*; C10G *21/28*
U.S. Cl. 208—308 17 Claims

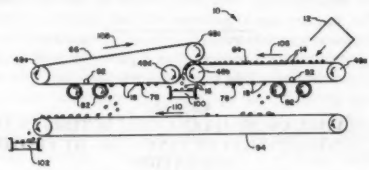

USE OF MEMBRANE PROCESS TO UPGRADE LOW VALUE MIDDLE DISTILLATE
FEED
HYDRO TREAT
PRODUCT 1 TO SOLVENT FRACTIONATION UNIT
LOW BOILING LIGHT POLAR AROMATIC EXTRACTION SOLVENT
PRODUCT 2

1. A process for producing high quality aromatic solvents in the middle distillate range containing 95+% aromatics comprising contacting a middle distillate feed having a molecular weight range of about 120 to 250 g/mole containing from 75 to 90% aromatics and diluted with a low boiling light polar aromatics extraction solvent wherein the concentration of said solvent in the feed is maintained between about 10 to 50 volume percent with a permselective membrane selected from regenerated cellulose, cellulose acetate and polyimide membranes under reverse osmosis conditions thereby selectively permeating the aromatic components of the distillate feed as the high quality solvent.

4,532,030
APPARATUS AND METHOD FOR SEPARATING PRODUCE SUCH AS RAISINS

Aaron M. Avedian, Visalia, and Verl A. Tyler, Reedley, both of Calif., assignors to A & M Farms, Inc., Tulare, Calif.

Filed Sep. 16, 1983, Ser. No. 533,201
Int. Cl.³ B07B *13/00*
U.S. Cl. 209—45 31 Claims



1. An apparatus for separating moldy fruit from non-moldy fruit, comprising:

a first conveyor belt to which moldy fruit will substantially adhere and to which non-moldy fruit will not substantially adhere when a gentle pressure is applied;

a second conveyor belt to which moldy fruit will substantially adhere and to which non-moldy fruit will not substantially adhere when a gentle pressure is applied;

means for supporting the first conveyor belt and the second conveyor belt such that a portion of the first conveyor belt overlaps and is positioned in close proximity to a portion of the second conveyor belt, said overlapping portions of the first and second conveyor belts being positioned so as to be capable of exerting a gentle pressure on fruit which passes between said overlapping portions such that the moldy fruit will substantially adhere to either the first conveyor belt or the second conveyor belt;

means for propelling the first and second conveyor belts such that said overlapping portions of the first and second conveyor belts are propelled in substantially the same direction at substantially the same speed;

means for receiving non-moldy fruit which does not adhere to either the first conveyor belt or the second conveyor belt after passing between said overlapping portions; and

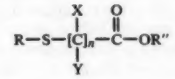
means for removing moldy fruit from the first and second conveyor belts after said moldy fruit passes between said overlapping portions.

4,532,031
FROTH FLOTATION PROCESS

Samuel S. Wang, Cheshire, and Michael J. Scanlon, Stratford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 390,574, Jun. 21, 1982, Pat. No. 4,394,257, which is a continuation of Ser. No. 95,839, Nov. 19, 1979, abandoned. This application Apr. 21, 1983, Ser. No. 487,363
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 4 Claims

1. A process for collecting mineral values from an ore wherein said process comprises mixing ground ore with water to form an aqueous ore pulp, adding to said aqueous ore pulp an effective amount of a frother, aerating said aqueous ore pulp and thereafter recovering said mineral values, wherein the frother is of the general structure:



wherein R is taken from the group consisting of a saturated

aliphatic radical of 1 to 12 carbon atoms, inclusive; a phenyl and an alkylaryl wherein the allyl group consists of a saturated aliphatic radical of 1 to 6 carbon atoms, inclusive; n is an integer of 1 to 4, inclusive; x and y are individually either hydrogen or a saturated aliphatic radical of 1 to 8 carbon atoms, inclusive; and R'' is an aliphatic radical having 1 to 8 carbon atoms, inclusive.

4,532,032
POLYORGANOSILOXANE COLLECTORS IN THE BENEFICIATION OF FINE COAL BY FROTH FLOTATION

Fook L. Ng, Dee Why, and Bruce S. Higgs, St. Marys, both of Australia, assignors to Dow Corning Corporation, Midland, Mich.

Filed May 30, 1984, Ser. No. 615,433
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **34 Claims**

1. A froth flotation process for the beneficiation of fine coal, which process comprises the steps of forming an aqueous slurry of the fine coal, adding a collector and a frothing agent to the aqueous slurry of fine coal, subjecting the aqueous slurry of fine coal containing the collector and frothing agent to froth flotation and separating the floated material which consists essentially of the beneficiated fine coal, wherein the collector is a water-dispersible polyorganosiloxane, or a mixture of water-dispersible polyorganosiloxanes, of the general formula

$$R_aQ_bSiO_{(4-a-b)/2}$$

where a has an average value of 0 to less than four, b has an average value of greater than zero to less than four, the sum (a+b) has an average value of 0.9 to 2.7, R is a monovalent alkyl radical containing 1 to 20, inclusive, carbon atoms or a —OH radical, and Q is an aryl radical, attached to silicon through a Si—C bond, which is selected from the group consisting of phenyl, benzhydryl, benzyl, alpha-methylbenzyl, methylbenzyl, tolyl, phenethyl, alpha-methylphenethyl, and beta-methylphenethyl radicals.

4,532,033
METHOD FOR BENEFICIATING ORES

Robert J. Anthes, Plainsboro, and Ross A. Kremer, Ringoes, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,176
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **5 Claims**

1. A method for beneficiating phosphate ores by froth flotation, said method comprising the steps of:

(i) conditioning a phosphate ore feed by raising the pH with a strong base;

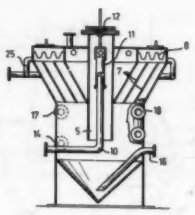
(ii) conditioning the phosphates ore feed resulting from step (i) by admixing therewith a mixture of a fatty acid and fuel oil; and

(iii) reducing the pH of the conditioned phosphate ore feed resulting from step (ii), before rougher flotation, by the addition thereto of a sufficient amount of a mineral acid or organic acid to lower the pH to within a range of from about 6.4 to about 7.0 and recovering phosphates in the float of the rougher floatation.

4,532,034
CONTINUOUSLY OPERATING SEPARATING APPARATUS FOR THE SEPARATION OF MIXTURES OF LIGHT AND HEAVY LIQUID COMPONENTS

Lindqvist Hans, Nikkilä, and Grönberg Vidar, Järvenpää, both of Finland, assignors to Linotek, Oy, Järvenpää, Finland

Filed Jan. 4, 1984, Ser. No. 568,247
Claims priority, application Finland, Jan. 11, 1983, 830097
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—112 **9 Claims**



1. An apparatus for continuously separating liquid mixtures containing relatively heavy and lighter liquid fractions, solid impurities, and organic matter suspended therein and which is characterized by separation through rapid dynamic circulation and gravitation and by its efficient and dependable manner of operation comprising:

a vertically oriented vessel defining therewithin a mixing portion positioned generally centrally of said vessel, a separating portion disposed generally above said mixing portion, and a collection portion disposed below said mixing portion in generally the bottom of said vessel;

said mixing portion including liquid feed means, connected to said vessel, for tangentially introducing the liquid mixture to be separated into said mixing portion, a vertical cylinder axially mounted within the vessel and having an open lower terminal end disposed below the point of liquid mixture introduction into said vessel by said feed means, and liquid circulating means connected to said vessel for inducing a rapid rotary flow path for the liquid mixture about said vertical cylinder to induce the substantial separation of the liquid mixture into heavier and lighter liquid fractions to thereby form an organic matter containing interface, between said fractions in said vessel while dispersing a portion of the organic matter layer previously formed at the interface into the heavier fraction and to allow upward flow by gravitation of the heavier fraction into said vertical cylinder and the lighter fraction into said separating portion;

said separating portion including lighter liquid fraction discharge means connected to said vessel for transporting the separated lighter liquid fraction from the interior of said separating portion of said vessel, and a plurality of cones mounted within said vessel in said separating portion and positioned one inside the other in upright spaced apart relation with the walls of said cones at angles less than ninety degrees from the horizontal axis and defining a series of spaced apart passages between said cones extending generally from said mixing portion to said lighter liquid fraction discharge means for flow therethrough of the lighter liquid fraction and for reducing the quantity of heavier particles which may remain dispersed in said lighter liquid fraction following treatment of the liquid mixture in said mixing portion;

heavier liquid fraction discharge means connected to said vessel and including an insert portion having an inlet end for receiving liquid and being disposed within and in substantially concentric relation to said vertical cylinder so as to form a passageway at the lower terminal end of said vertical cylinder between the interior wall of said vertical cylinder and the exterior wall of the insert portion

for transporting the heavier liquid fraction which flows through said passageway from the interior of said vessel; and

said collection portion comprising impurity collection means for receiving solid impurities which settle out of the liquid mixture during operation of the apparatus.

4,532,035

ROTATING BIOLOGICAL CONTACTOR FOR THE BIOLOGICAL PURIFICATION OF WASTE WATER

Ernst Fuchs, Schmerikon, and Andreas Dudli, Uetliburg, both of Switzerland, assignors to Mecapec S.A., Schmerikon, Switzerland

Filed Dec. 27, 1982, Ser. No. 453,625

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201848

Int. Cl.³ C02F *1/74*

U.S. Cl. 210—150 **6 Claims**

1. Apparatus for biologically purifying waste water comprising one corrugated panel spirally wound up to form a multilayer convolute contactor body, the corrugations of said panel extending across the width of said multilayer convolute contactor body at an angle to the axis thereof and defining flow ducts for the waste water, said one corrugated panel having a plurality of portions along the length thereof, each portion forming a layer of said multilayer convolute contactor body, and the corrugations of each two adjacent portions extending at different angles to the axis of said multilayer convolute contactor body so that adjacent layers of said multilayer convolute contactor body have corrugations extending at different angles to the axis thereof, and the angle at which corrugations of each layer of said multilayer convolute contactor body extend to the axis thereof progressively changes from the outermost layer of said multilayer convolute contactor body to the innermost layer thereof.

4,532,036

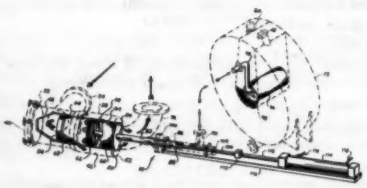
SELF-CLEANING FILTERING APPARATUS

Graham F. Clifford, Stanley, N.C., assignor to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Nov. 14, 1983, Ser. No. 550,948

Int. Cl.³ B01D *23/00, 23/04*

U.S. Cl. 210—167 **21 Claims**



1. A self-cleaning filtering apparatus for use in a material treating system of the type having a vessel in which material is subjected to treatment by fluid that is recirculated and conditioned for reuse by fluid circulating and conditioning means, said apparatus comprising: means defining a filtering chamber disposed in said circulating and conditioning means for circulation of said fluid therethrough; a filter element disposed in said chamber for passage of said fluid through said filter element to filter particulate contaminants from said fluid onto said filter element; a cleaning member having means defining a passage therein with an opening facing said filter element; means for traversing said cleaning member across the upstream surface of said filter element to allow particulate contaminants on said filter element to flow into the opening of said passage defining means of said cleaning member, thereby cleaning contaminants from said filter element; conduit means communicating with said passage and with the interior of said vessel for passage of contaminant containing fluid through said cleaning member and conduit means and into said vessel; and a contaminant collector in said vessel connected to said conduit means for discharge thereinto of said contaminant containing fluid, said collector being fluid-permeable and substantially contaminant impermeable for passage of fluid therethrough into said vessel and for collection of said contaminants in said collector.

11. A self-cleaning filtering apparatus according to claim 1 and characterized further in that said filter element is cylindrical and has an open end through which contaminant containing fluid flows into the interior of the element for filtering passage of fluid through the cylindrical surface of said element into said chamber exteriorly of said element with the contaminant retained on said element; said cleaning member including an annular head having an annular peripheral surface facing and closely adjacent the interior of said cylindrical filter element and having an axially extending tube connected to said head and extending exteriorly of said chamber for reciprocating actuation by said traversing means, said means defining said opening being provided in the peripheral surface of said head and said passage being formed in said tube and communicating with said opening for flow of contaminant containing fluid through said opening and passage to said conduit means exteriorly of said chamber.

4,532,037

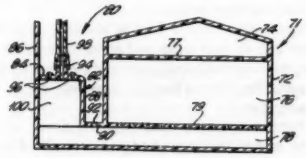
AQUARIUM AERATING DEVICE

Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Inc., Englewood, N.J.

Filed Jul. 11, 1983, Ser. No. 512,331

Int. Cl.³ B01D *35/00;* E03B *11/12*

U.S. Cl. 210—169 **3 Claims**



1. An integral aquarium filter and aeration device for an aquarium tank, comprising a housing having an inlet compartment in fluid flow relation with the tank, a filtration compartment in fluid flow relation with said inlet compartment, said filtration compartment adaptable to contain a mass of filtering material, an air lift tube in communication with said filtration compartment for the ingress of air and the egress of decontaminated water out of the filtration compartment, an integral aeration device within the air lift tube for aeration of the decontaminated water comprising an open ended container formed within said air lift tube and defining therein a chamber having an open lower end for maintaining therein a balance between a head of water and a pressurized air stream, air supply means passing downwardly through the open upper end of said air lift tube and coupled to an upper end of said

container for directing ingressed air into said chamber to form the pressurized air stream, and a plurality of apertures formed at an upper end of said container through which the air in the chamber can exit as a stream of bubbles, thereby causing the decontaminated water from the filtration compartment to egress upwardly through said air lift, whereby said apertures may be readily cleaned out when they become clogged with debris from the aquarium water, and the aquarium filter together with its integral aeration device can be reused.

4,532,038

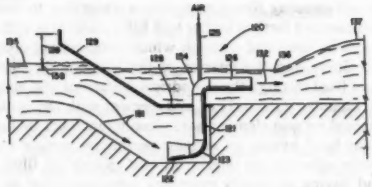
FLOW CONTROL APPARATUS FOR AEROBIC SEWAGE TREATMENT

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Division of Ser. No. 28,386, Apr. 4, 1979, abandoned, which is a continuation of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application May 11, 1983, Ser. No. 492,156

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—194 **11 Claims**



1. A flow-control apparatus for minimizing vertical circulation and preventing back-mixing of aerated liquid and for translationally moving said liquid through the channel of a closed-circuit oxidation ditch, said channel having a bottom and sides which comprise a pair of parallel straight outer sides, a pair of parallel straight inner sides defining a central partition which is disposed in parallel to and midway between said outer sides, and a pair of curved sides which are disposed at opposite ends of said pair of straight outer sides and are sealably connected thereto, whereby said channel comprises a pair of straight channels and a pair of semi-circular ends connecting said straight channels,

said flow control apparatus comprising, in combination with said closed-circuit oxidation ditch:

(A) at least one liquid-gas contact pump, having an intake end and a discharge end, which is disposed within one of said semi-circular ends; and

(B) a liquid-tight barrier that is sealably attached to said bottom and to said sides and to said pump between said intake end and said discharge end, so that said barrier is:

(1) a mounting means for disposing said pump within said channel, and

(2) a barrier means for dividing said liquid into an intake body and a discharge body so that all of the liquid in said intake body must pass through said pump to reach said discharge body and none of the liquid can pass therethrough more than once in each circuit of said closed-circuit oxidation ditch, said barrier means comprising:

(a) a vertically disposed barrier, blocking flow across one of said straight channels and having a bottom edge and a pair of side edges, which is sealably attached to said central partition along one side edge and to one of said straight sides along the other said side edge, and

(b) a horizontally disposed barrier having approximately a semi-circular shape, the curved edge thereof being sealably attached to the adjacent curved side of said one semi-circular end, one half of the straight edge thereof being sealably attached to said bottom edge, and the remaining one half of said straight edge being sealably attached to said bottom of said channel.

4,532,039

MULTI-LAYER COIL ASSEMBLY COAXIALLY MOUNTED AROUND THE ROTARY AXIS FOR PREPARATORY COUNTERCURRENT CHROMATOGRAPHY

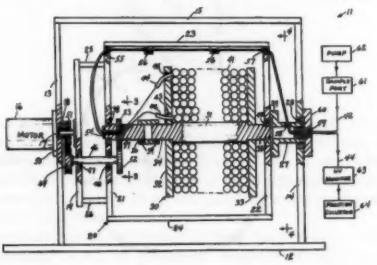
Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Mar. 14, 1983, Ser. No. 475,215

The portion of the term of this patent subsequent to Feb. 7, 2001, has been disclaimed.

Int. Cl.³ B01N *15/08*

U.S. Cl. 210—198.2 **10 Claims**



1. An apparatus for continuous countercurrent chromatography comprising a support, frame means journalled on said support for rotation around a substantially horizontal axis, separation column means comprising a multi-layer helically-coiled tubular column rotatably mounted on said frame means in multiple superposed coiled layers extending outwardly from said horizontal axis for rotation coaxially with said horizontal axis, inlet and outlet flow tubes connected to terminal ends of said multi-layer coiled column, and means to simultaneously rotate said frame means on the support and the multi-layer column on the frame means in the same direction, so as to simultaneously develop both gravitational force reversals and centrifugal forces in said multi-layer coiled column.

4,532,040

WATER TREATMENT DEVICE

Jasper L. Meeks, Rte. 2 Box 35-A, Edinburg, Tex. 78539, and John D. Corney, P.O. Box 2231, McAllen, Tex. 78501

Continuation-in-part of Ser. No. 332,615, Dec. 21, 1981, abandoned. This application May 10, 1984, Ser. No. 605,750

Int. Cl.³ B01B *35/06*

U.S. Cl. 210—222 **14 Claims**

1. A fluid treatment apparatus having an annular space for ionizing the fluid comprising elements designed, sized and positioned for providing constant velocity of fluid through the annular space, including:

(a) a casing;

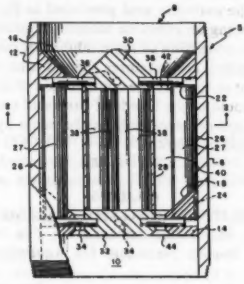
(b) an outer ring of magnets arranged about the inner circumference of the casing in space relationship;

(c) an inner ring of magnets arranged on the interior of the casing and spaced from the outer ring so as to form the annular space between the outer and inner rings of magnets;

(d) means to support said inner ring of magnets such that the annular space is an equal distance in all areas to permit flow of fluid therethrough at equal rates;

(e) a nosecone on the inlet end of the casing over the inner ring of magnets to facilitate movement of fluid into the

annular passage between the inner and outer rings of magnets; and



(f) a support ring secured over the outer ring of magnets to facilitate flow into the annular passage wherein the fluid must pass between the nosecone and the support ring.

4,532,041

ASYMMETRIC POLYIMIDE REVERSE OSMOSIS MEMBRANE, METHOD FOR PREPARATION OF SAME AND USE THEREOF FOR ORGANIC LIQUID SEPARATIONS

Harry F. Shuey, San Dimas, Calif., and Wankei Wan, Sarnia, Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 494,543, May 13, 1983, abandoned. This application Dec. 22, 1983, Ser. No. 564,302

Int. Cl.³ C08G *20/32*

U.S. Cl. 210—500.2 **14 Claims**

1. A high flux, high selectivity reverse osmosis asymmetric polyimide membrane for effecting organic liquid separations prepared by the process comprising:

(a) dissolving from 14–30 wt.% of an undegraded polyimide copolymer derived from the cocondensation of benzophenone 3,3',4,4'-tetracarboxylic acid dianhydride (BTDA) and a mixture of di(4 aminophenyl)methane and toluene diamine, or 4,4' methylenebis(-phenyl isocyanate) and toluene diisocyanate in a dual solvent system comprising dioxane anti-solvent and N,N-dimethylformamide (DMF) pro-solvent at an anti-solvent to prosolvent ratio of from about 10:1 to 1:1 to produce a casting solution;

(b) generating a thin layer of the polyimide co-polymer/dual solvent solution mixture;

(c) partially evaporating the solvent from the polyimide polymer-solvent thin layer for from 2 to 120 seconds;

(d) immersing the evaporated polymer-solvent thin layer in a gelation bath to form the asymmetric membrane.

4,532,042

PROCESS AND APPARATUS FOR THE CONTINUOUS ANAEROBIC DECOMPOSITION OF ORGANIC COMPOUNDS

Alexander Aivasidis, and Christian Wandrey, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,841

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247117

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—603 **16 Claims**

1. A process for the continuous anaerobical decomposition of organic compounds in an aqueous feed solution having a neutralized pH of between about 2 and 4, said solution being subjected, in a reactor, to the action of microorganisms which selectively decompose the compounds in a flow-through process which the production of biogas, said process comprising the steps of:

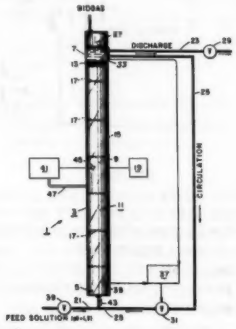
(1) introducing said aqueous feed solution into a fixed-bed reactor having microorganisms grown on a fixed-bed material at a first end thereof;

(2) discharging aqueous flown-through solution from said fixed-bed reactor at a second end thereof;

(3) recycling a portion of the discharged aqueous solution to the first end of the fixed-bed reactor;

(4) admixing said recycled portion of discharged aqueous solution with said aqueous feed solution to be introduced into said fixed-bed reactor at the first end thereof;

(5) measuring the pH at both the first and second ends of said



fixed-bed reactor in order to monitor the pH of said reactor bed; and

(6) selecting said portion of the discharged aqueous flown-through solution to be recycled and admixed with said aqueous feed solution such that the admixture introduced into the fixed-bed reactor maintains the pH of said reactor within a predetermined range of between about 6 and 7.2, such that the pH gradient between the first and second ends of said fixed-bed reactor is within a range of 0.3 pH units maintaining the aqueous solution within the fixed-bed reactor at a temperature of between about 30 and 40° C., and selectively reducing the residence time of the aqueous solution within the fixed-bed reactor until the volume of feed solution introduced into the reactor per unit time is maximized.

4,532,043

METHOD FOR CHARACTERIZING THE MOLECULAR WEIGHT AND MOLECULAR WEIGHT DISTRIBUTION OF ULTRA-HIGH MOLECULAR WEIGHT WATER SOLUBLE POLYMERS

Robert K. Prud'homme, Trenton, N.J.; Frederick W. Stanley, Jr., and Martin A. Langhorst, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1983, Ser. No. 523,818

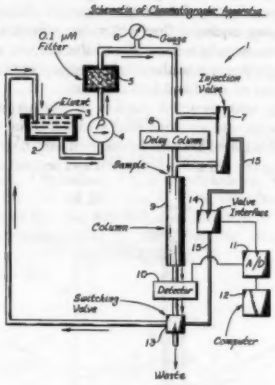
Int. Cl.³ B01D *15/08*

U.S. Cl. 210—635 **5 Claims**

1. A liquid chromatographic method for characterizing water soluble polymers by molecular weight and molecular weight distribution based on apparent size which comprises:

(a) adding to an aqueous eluent a sample of a detectable ultra-high molecular weight polymer in a solution concentration between the detectable limit and an upper limit below the concentration at which the elution of the polymer is detrimentally influenced by concentration, the sample added being dissolved in a primarily aqueous diluent not incompatible with the eluent, the added sample volume being not greater than that volume which would detrimentally influence the chromatography;

(b) passing the combined eluent and sample through a porous body composed of a packed bed of nonporous particles whereby the apparent size fractions of the polymer sample are separated by flow;



(c) detecting the amount of the eluting apparent size fractions of the polymer species; and

(d) using the data of step (c) to characterize the molecular weight and molecular weight distribution of the detected water soluble polymer.

4,532,044

ARSENIC REMOVAL METHOD

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 408,078, Aug. 16, 1982, Pat. No. 4,454,027. This application Mar. 30, 1984, Ser. No. 595,323

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—660 **8 Claims**

1. A method for removing arsenic from an aqueous fluid which comprises contacting the fluid with spent oil shale and separating a fluid having a reduced arsenic content.

4,532,045

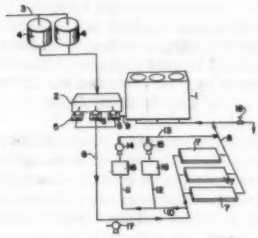
BLEED-OFF ELIMINATION SYSTEM AND METHOD

Robert J. Littmann, Westfield, N.J., assignor to Waterscience, Inc., Somerville, N.J.

Filed Jul. 7, 1982, Ser. No. 396,042

Int. Cl.³ B01D *15/04*

U.S. Cl. 210—668 **33 Claims**



1. A process for reducing bleed-off in an open circulating heat exchange system having circulating aqueous coolant, said process comprising the steps of (1) treating all or a selected portion of the aqueous coolant with a weak acid ion exchange resin to remove alkaline salts therefrom without removing salts of strong acids and to produce in situ carbonic acid from bicarbonate hardness in the aqueous coolant and thereby control the pH of the circulating aqueous coolant; (2) removing suspended solids from circulating aqueous coolant; (3) removing carbon dioxide from the carbonic acid produced in the treating step; and (4) introducing an effective amount of additional selected from the group consisting of scale inhibitors, corrosion inhibitors, microbiocides, and mixtures thereof into the circulating aqueous coolant so that, by the combination of steps (1), (2), (3) and (4), the amount of the bleed-off from said system is at most 66% of the bleed-off necessary in the same system without such combination of steps.

4,532,046

METHOD FOR HINDERING THE SCALING BY WATERS

Gilles Meunier, Mazerolles, and Lino Vio, Pau, both of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Aug. 24, 1983, Ser. No. 526,026

Claims priority, application France, Nov. 24, 1982, 82 19662

Int. Cl.³ C02F *5/12*

U.S. Cl. 210—698 **16 Claims**

1. A method of hindering the scaling of surfaces through the deposition thereon of alkaline earth compounds from a water containing the same, which comprises dissolving in the water a scale inhibiting amount of a member selected from the group of:

(a) a hydroxamic group bearing homopolymer having a molecular weight between 800 and 20,000, said hydroxamic group attached to a linear polyolefinic hydrocarbon chain, and

(b) a hydroxamic group bearing copolymer, said hydroxamic group being attached to a linear polyolefinic hydrocarbon chain which is a copolymer with functional groups selected from the group consisting of acrylic acid, an acrylic ester, a salt of acrylic acid, maleic acid, a maleic ester, a salt of maleic acid, vinyl acetate, vinyl pyrrolidone, butadiene, styrene, and acrylonitrile, the proportions of hydroxamic groups to other functional groups being from 15 to 85 of the total of said hydroxamic and other functional groups, and said copolymer having a molecular weight between 800 and 7500.

4,532,047

SILICA INHIBITION: PREVENTION OF SILICA DEPOSITION BY ADDITION OF LOW MOLECULAR WEIGHT ORGANIC COMPOUNDS

Leonard Dubin, Skokie, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 29, 1984, Ser. No. 626,173

Int. Cl.³ C02F *5/10, 5/12*

U.S. Cl. 210—698 **10 Claims**

1. A method of inhibiting amorphous silica scale formation on surfaces in contact with industrial waters having a ph of at least 5.0 which comprises treating said waters with an effective amount for the purpose of inhibiting amorphous silica scale formation of at least one water soluble polypolar organic compound containing hydroxyl and/or primary amino functional groups, wherein the polypolar organic compound has a molecular weight not exceeding about 500, and is selected from the group consisting of glycerine, 1,5-hexamethylenediamine, Bis-hexamethylene triamine, ethylene glycol, triethylenetetraamine, ethylene diamine, diethanolamine, monoethanolamine, N-ethylamine monoethanolamine.

8. A method of inhibiting amorphous silica scale formation on surfaces in contact with industrial waters having a ph of at least 5.0 which comprises treating said waters with an effective amount of an admixture of a water-soluble polypolar organic compound containing hydroxyl, primary amino, or secondary amino functional groups, and mixtures thereof, having a molecular weight not exceeding about 500, with a boron compound which forms orthoborate ion when dissolved in or

hydrolyzed by said waters, and wherein the polypolar organic compound and orthoborate ion are in a weight ratio of about 10:1 to 1:10.

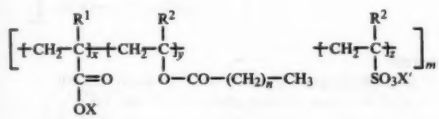
4,532,048

METHOD FOR INHIBITING SCALE DEPOSITION

Zahid Amjad, Avon Lake, and William F. Masler, III, Hinckley, both of Ohio, assignors to B. F. Goodrich Company, Akron, Ohio

Filed Sep. 23, 1983, Ser. No. 535,097
Int. Cl.³ C02F *5/10*
U.S. Cl. 210—701 **18 Claims**

1. A method of inhibiting the deposition of scale due particularly to calcium phosphate, zinc phosphate and magnesium phosphate formed in a system for treating process water, comprising, adding to said process water from 1 part per million (pp) to about 200 ppm of a water-soluble essentially non-cross-linked random copolymer, optionally after said copolymer is subjected to hydrolytic conditions, said copolymer having the structural formula



wherein,

R^1 represents H, or methyl;

R^2 represents H, methyl or ethyl;

X is selected from the group consisting of H, NH_4, an alkali metal, an alkaline earth metal and zinc;

n is either 0 or 1;

X' is selected from NH_4, an alkali metal, an alkaline earth metal and zinc;

z is a number in the range from 0 to about 1.0;

m is an integer in the range from about 3 to about 70;

x is a number in the range from about 2.5 to about 15.0 times the amount of y present; the mole ratio of reactants used to form the copolymer contains at least 50 mole percent of acrylic or methacrylic acid relative to the remaining constitutents of the copolymer; and, x, y and z are present in relative heterogeneous order.

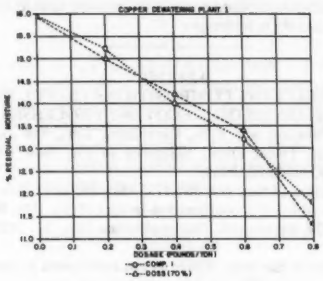
4,532,049

DEWATERING AGENT COMPOSITIONS FOR SULFIDE MATERIALS

William J. Roe, Aurora, and Jacqueline L. Perisho, Oak Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 10, 1984, Ser. No. 608,844
Int. Cl.³ B01D *37/00*; C02F *1/38*
U.S. Cl. 210—728 **2 Claims**

1. A process for reducing the moisture content of mineral concentrates by subjecting said mineral concentrates to a dewatering process which comprises mixing with an aqueous slurry of said mineral concentrate an effective dewatering amount of a branched dodecyl benzene sulphonic acid which is combined with sodium xylene sulfonate in a weight ratio of between 5:1 to 3:1 and then subjecting the thus-treated mineral concentrate to a dewatering process comprising filtration or



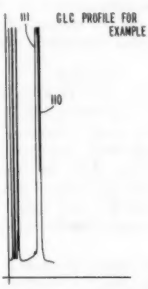
centrifugation whereby the moisture content of said mineral concentrate is reduced.

4,532,050

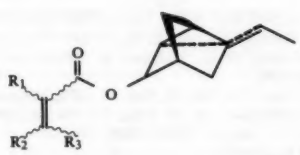
NORBORNYL ESTERS AND USES THEREOF IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF A CONSUMABLE MATERIAL AND PROCESS FOR PREPARING SAME

Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 574,183, Jan. 26, 1984, Pat. No. 4,502,294, which is a division of Ser. No. 507,290, Jun. 23, 1983, Pat. No. 4,480,648, which is a division of Ser. No. 396,288, Jul. 8, 1982, Pat. No. 4,435,316. This application Aug. 24, 1984, Ser. No. 643,739
Int. Cl.³ C07C *69/533*; A61K *7/46*
U.S. Cl. 252—8.6 **10 Claims**



1. A process for augmenting or enhancing the aroma of a perfumed fabric softener composition or dryer added fabric softener article or a solid or liquid anionic, cationic, non-ionic or zwitter-ionic detergent comprising the step of adding to said perfumed article an aroma augmenting or enhancing quantity of at least one ester defined according to the structure:



wherein one of the dashed lines represents a carbon-carbon

bond and the other of the dashed lines represents no bond; wherein the wavy lines represent a "cis" or a "trans" juxtaposition of the R_1, R_2, R_3 and carboalkoxy moieties around the carbon-carbon double bond; wherein R_1, R_2 and R_3 each represents methyl or hydrogen with the proviso that at least one of R_1, R_2 and R_3 is hydrogen.

4,532,051

SURFACTANT COMPOSITIONS USEFUL IN ENHANCED OIL RECOVERY PROCESSES

Nancy J. Nuckels neé Byth, Carrollton, Tex., and James L. Thompson, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 267,177, May 26, 1981, Pat. No. 4,426,303, which is a continuation-in-part of Ser. No. 99,264, Dec. 3, 1979, abandoned. This application Nov. 14, 1983, Ser. No. 551,236

The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **12 Claims**

1. An aqueous surfactant composition comprising:

(1) at least one alkylated diaromatic sulfonate in an amount sufficient to impart good compatibility with subterranean reservoir brines,

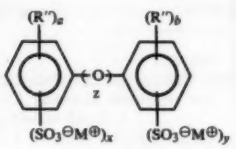
(2) at least one petroleum sulfonate in an amount sufficient to provide an interfacial tension of no greater than 0.1 dyne per centimeter between said aqueous composition and the oil of a subterranean reservoir,

(3) at least one condensation product of a C_8–C_{16} alkanol and a C_2–C_3 alkylene oxide, or a sulfate of said condensation product, as a solubilizing and wetting agent for said petroleum sulfonate, and

(4) at least one glycol ether of the formula:

$$R(OR')_n—OH \qquad (I)$$

wherein R is a C_1–C_6 alkyl radical or a phenyl radical, R' is a C_2–C_4 alkylene radical, and n is 1–5 in an amount sufficient to reduce absorption of the other components of said composition on the surface of said reservoir, and wherein the alkylated diaromatic sulfonate is of the formula:



(II)

each R'' is an alkyl radical of between about 10 and about 18 carbon atoms,

each $M^{\oplus}$ is a hydrogen, alkali metal ion, alkaline earth metal ion or ammonium ion,

a and b are individually 0 or 1 with the proviso that the $\epsilon(a+b)$ is at least 1,

x and y are individually 0 or 1 with the proviso that the average value of $\epsilon(x+y)$ for all (II) is at least about 1.7, and z is 0 or 1.

4,532,052

POLYMERIC WELL TREATING METHOD

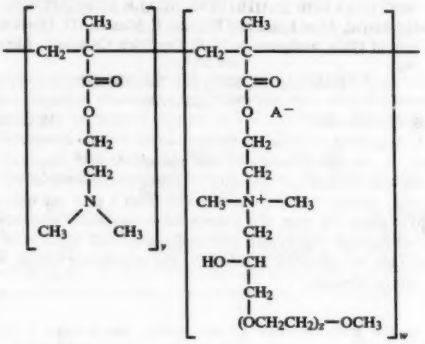
Jimmie D. Weaver; Lawrence E. Harris, and Weldon M. Harms, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 946,709, Sep. 28, 1978, abandoned. This application Aug. 25, 1982, Ser. No. 411,209

Int. Cl.³ E21B *43/22, 33/138*

U.S. Cl. 252—8.55 R **4 Claims**

1. A method of treating a subterranean particulate formation to alter the relative mobilities of oil and water in and through the formation comprising contacting the formation with a branched organic polymer dissolved or dispersed in an aqueous carrier fluid in an amount sufficient to provide a concentration of from about 0.005 to about 1 percent by volume of said carrier fluid and for a period of time sufficient for the polymer to absorb on or otherwise attached to the formation, the branched organic polymer having a molecular weight of from about 900 to about 50,000,000 and having the structural formula:



wherein:

v is in the range of from about 10 to about 15,000;

w is in the range of from about 1 to about 5,000;

z is in the range of from about 2 to about 10,000; and

A^- is an anion or anionic group associated with the quaternary nitrogen.

4,532,053

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Jun-ichi Yamada, Narashino, and Toshiyuki Ukigai, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,360

Claims priority, application Japan, Jan. 28, 1982, 57-10858

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **4 Claims**

1. A micellar slug for use in the recovery of oil, said micellar slug consisting essentially of 4% to 90% by weight of a hydrocarbon, 4% to 92% by weight of an aqueous medium, 3% to 30% by weight of a surfactant containing, as an essential component, an internal olefin sulfonate having 10 to 30 carbon atoms, and 0.1% to 20% by weight of a cosurfactant.

4,532,054

POLYETHERIMIDE BEARING COMPOSITIONS

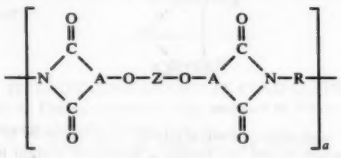
Robert O. Johnson, Marietta, Ga., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 454,064, Dec. 28, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 626,728

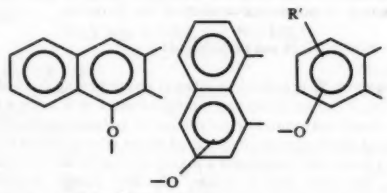
Int. Cl.³ C10M *7/16, 7/30*

U.S. Cl. 252—12.4 **15 Claims**

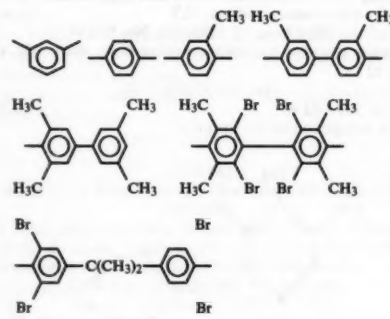
1. A bearing composition which comprises a polyetherimide resin of the formula:



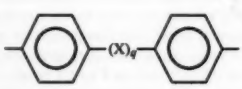
and the following modifiers and reinforcements: (a) from about 1% to about 25% by wt. of a fluoropolymer; (b) from about 1% to about 25% by wt. of a lubricating agent selected from the group consisting of silicone fluid, a molybdenum disulfide, graphite or a molybdenum disulfide-containing solid lubricant, or any mixture thereof; and (c) from 0% to about 50% of a reinforcing agent selected from the group consisting of glass fibers, carbon fibers, glass beads and mixtures thereof; wherein the above proportions are selected such that said bearing compositions contain from about 35% by wt. to about 60% by wt. polyetherimide resin and from about 40% by wt. to about 65% by wt. modifiers and reinforcements; wherein "a" represents a whole number from about 10 to about 10,000, the group —O—A< is selected from:



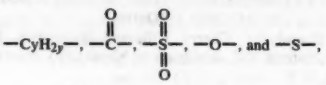
wherein R' is hydrogen, lower alkyl or lower alkoxy; Z is a member of the class consisting of (1)



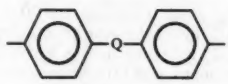
and (2) divalent organic radicals of the general formula



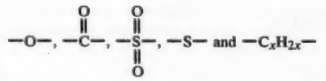
where X is a member selected from the class consisting of divalent radicals of the formula:



where q is 0 or 1, y is a whole number from 1 to 5 and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6 to 20 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (3) divalent radicals of the formula



where Q is a member selected from the class consisting of



where x is a whole number from 1 to 5 inclusive.

4,532,055

RELEASING LUBRICANT FOR USE IN FORGING AND EXTRUSION PROCESSES

Kiyohisa Eguchi, Kawanishi; Norio Kitamura, Itami; George Ohta, Ikoma; Terumasa Okamura, Kashiwa, and Seiji Yamada, Toyohashi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo; Hanano Commerical Co., Ltd., Kobe; Taihei Chemical Industrial Co., Ltd., Osaka and Kabushiki Kaisha Gosei Kagaku Kenkyusho, Tokyo, all of, Japan

Filed Oct. 4, 1983, Ser. No. 538,885

Claims priority, application Japan, Oct. 6, 1982, 57-174493

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.³ C10M *1/50*

U.S. Cl. 252—28 **13 Claims**

1. A releasing lubricant for use in forging and extrusion processes which comprises a mixture of:

(a) at least one compound selected from the group consisting of phosphoric acid, metaphosphoric acid, polyphosphoric acid, and sodium and potassium salts thereof,

(b) at least one compound selected from the group consisting of boric acid, sodium borate and potassium borate,

(c) at least one compound selected from the group consisting of alkali metal carbonates, nitrates, sulfates and hydroxides, and

(d) a phyllosilicate,

wherein the amounts of the compounds (a) to (c) are: 14 to 55 molar % of P_2O_5, 0 to 80 molar % of B_2O_3 and 30 to 80 molar % of M_2O, and the total amount of these compounds is 91 to 99.5 wt. % or 0.5 39 wt. % based on the solid.

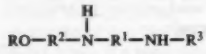
4,532,056

LUBRICANT COMPOSITION CONTAINING A BORON REACTION PRODUCT

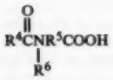
Andrew G. Horodysky, Cherry Hill, and Richard S. Herd, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,358
Int. Cl.³ C10M 1/54
U.S. Cl. 252—49.6 31 Claims

1. A product of reaction made by reacting (1) a diamine of the formula



wherein R is a hydrocarbyl group containing 6 to 20 carbon atoms, R^1 and R^2 are C_2 or C_3 hydrocarbylene groups, preferably alkylene groups and R^3 is hydrogen or a hydrocarbyl group having 1 to 6 carbon atoms, with (2) a boron-containing compound and (3) an acyl sarcosine of the formula:



where R^4 is a hydrocarbyl group containing 6 to 20 carbon atoms, R^5 is a hydrocarbylene group containing 1 to 6 carbon atoms and R^6 is hydrogen or a C_1 to C_6 hydrocarbyl group, the reactions being carried out at a temperature within the range of from about 80° C. to about 260° C., such that in the initial reaction from about 5% to about 95% of the amino groups are reacted and in the final reaction from about 5% to about 100% of the remaining amino groups are reacted.

4,532,057

LUBRICANT COMPOSITION COMPRISING THE REACTION PRODUCT OF A VICINAL DIOL AND A DIHYDROCARBYL PHOSPHITE

Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,360
Int. Cl.³ C10M 1/45
U.S. Cl. 252—49.8 20 Claims

1. A product of reaction obtained by reacting a vicinal diol containing 10 to 30 carbon atoms with a dihydrocarbyl phosphite containing 1 to 6 carbon atoms, the reaction being carried out at from about 80° C. to about 225° C. using a mole ratio of diol to phosphite of from about 1:1 to about 3:1.

4,532,058

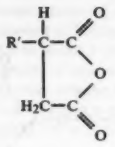
SPIROLACTONE CONDENSATION PRODUCT DISPERSANTS AND LUBRICANTS CONTAINING SAME

Harry Chafetz, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 190,687, Sep. 25, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,861
Int. Cl.³ C10M 1/32
U.S. Cl. 252—51.5 A 11 Claims

1. Dispersant additives for motor oils comprising products prepared by the process which comprises,

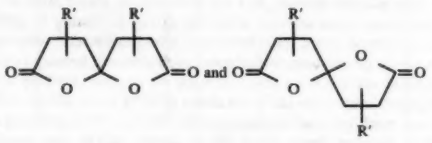
intermolecularly decarboxylating and cyclizing by heating to about 180° C. to about 270° C., under a substantially inert atmosphere, an alkenylsuccinic anhydride of the formula:



wherein R′ is an alkenyl radical having from about 64 to 1500 aliphatic carbon atoms and having a molecular weight in the range of about 1000 to about 22,000

in the presence of about 0.1 to 10 mole percent thereof of a basic catalyst

to form bicyclic spirodilactone condensation products represented by the formula:



wherein R′ is as above; and the spirolactone function is substantially in the center of the molecules and,

heating said products to about 75° to 200° C. with a polyamine or polyamine alcohol of the formulas:

$$H_2N(RNH)_nH \text{ and } HO(RNH)_nH$$

wherein R is a divalent alkenyl group having from about 2 to 6 carbon atoms and n ranges from 1 to 6, using a ratio of said polyamino or polyamine or polyamino alcohol to said condensation products of about 60:1 to about 0.5:1.

8. A motor oil containing a major amount of an oil of lubricating viscosity and a minor, effective sludge dispersant, amount of at least one additive as defined by claims 1, or 2.

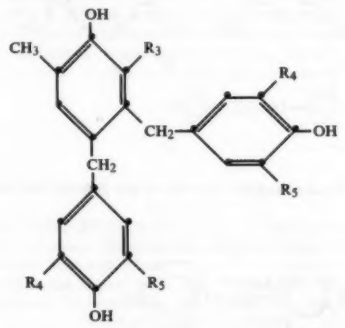
4,532,059

BENZYLATED PHENOLS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,644
Claims priority, application Switzerland, Nov. 25, 1982, 6875/82
Int. Cl.³ C10M 1/20
U.S. Cl. 252—52 R 9 Claims

1. A compound of the formula



wherein R_3, R_4 and R_5 are C_1–C_4 alkyl, cyclohexyl, phenyl, C_7–C_9 aralkyl or C_7–C_{10} alkaryl.

6. A composition of matter, comprising an organic material subject to oxidative, thermal and actinic degradation stabilized, with an effective stabilizing amount of a compound according to claim 1.

4,532,060

HYDROCARBON OXIDATE COMPOSITION

Donald D. Carlos, Louisville, Ky., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 24, 1983, Ser. No. 544,655
Int. Cl.[3] C10M *5/12, 1/20*
U.S. Cl. 252—55 56 Claims

1. A hydrocarbon wax oxidate composition having high viscosity comprising the reaction product:

(a) a hydrocarbon wax oxidate having from 20 to 50 carbon atoms per molecule and an acid number ranging from about 35 to about 120, with

(b) a polyol capable of increasing the viscosity of the resulting product to at least 10,000 cps at about 25° C. when conducting the reaction at least 100° F., or the metal salt of said reaction product.

4,532,061

GRAFTED POLYALPHAOLEFIN POLYMERS, METHOD FOR ITS PRODUCTION AND OILS CONTAINING IT

Frederick C. Loveless, Cheshire, and David J. Smudin, Waterbury, both of Conn., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Sep. 8, 1983, Ser. No. 530,335
Int. Cl.[3] C10M *1/30*
U.S. Cl. 252—58 5 Claims

1. A method of making grafted polyalphaolefin polymer comprising

(A) providing

(a) an aluminum compound having the formula $R_3Al_2X_3$ or R_nAlX_{3-n}, wherein R is C_1–C_{18} alkyl, C_7–C_9 aralkyl, C_7–C_9 alkaryl or C_6–C_{10} aryl; X is Cl, Br or I, and n is an integer from 1 to 3;

(b) a polyhalogenated compound having the formula $(—CH_2CR^1R^2)_mY_p$, wherein R^1 is hydrogen or C_1–C_3 alkyl; R^2 is linear or branched C_1–C_{30} alkyl; Y is Cl, Br or I; m is an integer from 3 to 3000; and p is an integer of at least 3;

(c) a cationically polymerizable monomer having the formula $CH_2{=}CR^1R^2$, wherein R^1 is hydrogen and R^2 is linear C_1–C_{30} alkyl; and

(B) bringing into contact above (a), (b) and (c) under polymerization conditions.

4,532,062

ADDITIVE FOR POWER TRANSMISSION SHIFT FLUIDS

Jack Ryer, East Brunswick; Ricardo Bloch, Scotch Plains, and Harold E. Deen, Cranford, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 23, 1984, Ser. No. 573,122
Int. Cl.[3] C10M *1/32;* C07D *417/00*
U.S. Cl. 252—78.1 5 Claims

1. A power shift transmission fluid composition comprising a major amount of hydrocarbon mineral oil of lubricating viscosity and an effective oxidation and corrosion inhibiting and friction modifying amount of an additive being an amine or ammonium salt of mercaptobenzothiazole dissolved in a molar excess of amine, said salt being formed by reacting mercaptobenzothiazole with a molar excess of a liquid amine, said excess being about 1.2 to 3 moles of amine per mole of mercaptobenzothiazole, the amine having the formula $R_1R_2R_3N$ at 50°–80° C. when R_1 and R_2 may be hydrogen or lower C_1–C_4 alkyl and R_3 is a C_6–C_{20} alkyl.

4,532,063

DISSOLVABLE BLEACH SHEET

Thomas D. Gueldenzopf, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 15, 1983, Ser. No. 523,316
Int. Cl.[3] C11D *17/06*
U.S. Cl. 252—90 9 Claims

1. A storage stable laundry bleach sheet soluble in water and containing a composition comprising a dry particulate bleaching compound selected from the group consisting of sodium dichloroisocyanurate dihydrate, sodium dichloroisocyanurate, potassium dichloroisocyanurate dihydrate, potassium dichloroisocyanurate, sodium perborate monohydrate, sodium perborate tetrahydrate and sodium percarbonate and mixtures thereof; a bleach stable film-forming water-soluble hydroxypropyl cellulose polymer having at least 2.5 moles of propylene oxide per anhydroglucose unit and having a molecular weight of less than 1,000,000; a solubilizer selected from the group consisting of sodium carbonate, sodium phosphate, sodium bicarbonate, sodium pyrophosphate, sodium tripolyphosphate, sodium borate, sodium citrate, sodium silicate, sodium hydroxide, sodium sulfate, zeolite and mixtures thereof and a bleach-stable surfactant wherein the weight ratio of bleaching compound to polymer is within the range from 10:1 to 1:2; the weight ratio of solubilizer to polymer is within the range from 3:1 to 1:20 and the weight ratio of surfactant to polymer is within the range of from 1:1 to 1:20 and wherein the bleach sheet contains from 2 to 20 grams of bleaching compound.

4,532,064

AQUEOUS ENZYME-CONTAINING COMPOSITIONS WITH IMPROVED STABILITY

Jelles V. Boskamp, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,942
Claims priority, application United Kingdom, Apr. 26, 1983, 8311314
Int. Cl.[3] C11D *7/42*
U.S. Cl. 252—105 4 Claims

1. An aqueous, enzymatic liquid detergent composition comprising, in an aqueous liquid medium, as essential ingredients, from 1–60% by weight of an active detergent material selected from the group consisting of soap, anionic, nonionic, cationic, zwitterionic and amphoteric surfactants and mixtures thereof, from 1–60% by weight of a detergent builder, from 0.001–10% by weight of bacterial or fungal enzymes and a stabilizing system for said enzymes, wherein the stabilizing system consisting essentially of a mixture of

(A) an inorganic compound selected from the group consisting of boric acid, boric oxide, alkalimetal borate, a reducing alkalimetal salt having an oxygenated sulphur anion S_aO_b, in which a and b are whole numbers from 1 to 8, and mixtures thereof, and

(B) a dicarboxylic acid of the general formula

$$COOH—(CHOH)_a—(CH_2)_b—(CHOH)_c—(CH_2)_d—COOH$$

in which a, b, c and d are whole numbers from 0–4, the sum of a, b, c and d being from 0–4, whereby, when a=c=0 and b=c=1, the corresponding dicarboxylic acid may also be unsaturated, or the alkalimetal, ammonium, alkanolamine or alkaline earth metal salts thereof, whereby the amount of (A) is from 1–15% by weight for the boron compounds and from 2–20% by weight for the reducing alkalimetal salt and the amount of (B) is from 0.5–15% by weight.

4,532,065

METHOD AND COMPOSITION FOR CLEANING ANODIZED ALUMINUM

Leon E. Cohen, Highland Park, and John A. Hook, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 5, 1981, Ser. No. 270,772
Int. Cl.³ C11D *7/10, 3/06*
U.S. Cl. 252—135 6 Claims

1. A method of cleaning anodized aluminum by cleaning it with an aqueous solution comprising a detergent agent, a detergent builder and a water-soluble transition metal salt in an amount sufficient to form a transition metal chelate with the detergent builder and thereby protect the anodic coating of the anodized aluminum from attack by solutions of the composition.

4,532,066

STABLE MILDLY ACIDIC AQUEOUS POLISHING CLEANSER AND PREPARATION THEREOF

Leon E. Paszek, Mountainside, and Ernest Bernarducci, Rutherford, both of N.J., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 585,947
Int. Cl.³ C11D *7/08*
U.S. Cl. 252—144 6 Claims

1. A stable mildly acidic aqueous polishing cleanser for removing stains from hard surfaces comprising by weight from about 8 to 20% of a polishing agent having an average particle size of about 2 to 10 microns and a particle size distribution from about 1 to 40 microns, from about 1 to 5% of a nonionic surfactant, from about 1 to 2.25% of a thickening agent comprising smectite clay and xanthan gum in a ratio of about 2:1 respectively, from about 1.25 to 6.25% of an oxalate salt selected from ammonium bioxalate or a mixture of ammonium bioxalate and ammonium oxalate, and from about 68 to 89% of water, said cleanser having a pH of about 3.0 to 4.5.

4,532,067

LIQUID DETERGENT COMPOSITIONS CONTAINING HYDROXYPROPYL METHYLCELLULOSE

Tamara Padron, North Bergen, and Ignacio Lopez, Guttenberg, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,802
Int. Cl.³ C11D *17/00*
U.S. Cl. 252—174.17 11 Claims

1. An aqueous liquid detergent composition for exhibiting good freeze thaw and low temperature storage stability comprising:

(i) from about 0.1% to about 1.5% hydroxypropyl methylcellulose having from 28 to 30% methoxyl and 7 to 12% hydroxypropyl substitution, the molecular weight ranging from 5 to 250 cps expressed as nominal viscosity of a 2% aqueous solution at 68° F.;

(ii) from about 0.1% to about 15% of a nonionic surfactant;

(iii) from about 5% to about 30% of an anionic surfactant; and

(iv) from about 1% to about 30% of a builder.

4,532,068

METHOD FOR IMPROVING THE INITIAL ACTIVITY OF ACTIVATED HYDRAZINE

Wilfried Fuchs, Halle-Neustadt; Horst Richter, Bad Dürrenberg; Vendelin Kaufmann, Leuna; Christina Müller, Leuna; Roland Kober, Leuna, and Wolfgang Renker, Leuna, all of German Democratic Rep., assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 474,078
Int. Cl.³ C02F *1/20, 1/70*; C09K *15/00*; C23F *11/18*
U.S. Cl. 252—188.28 10 Claims

1. A composition for improving the initial activity of activated hydrazine, with respect to hydrogen dissolved in water, comprising a trivalent cobalt complex with inorganic ligands as complex constituents, together with an added coactivator component selected from the group of trivalent phenols consisting of pyrogallol, oxyhydroquinone, and phloroglucine.

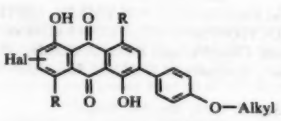
4,532,069

ANTHRAQUINONE DYESTUFFS FOR LIQUID CRYSTAL DIELECTRICS

Günter Scherowsky, and Michael Bütow, both of Berlin, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,865
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247896
Int. Cl.³ C09K *3/34*; G02F *1/13*; C09B *1/02, 1/04, 1/50*; G09F *9/35*
U.S. Cl. 252—299.1 14 Claims

1. In a liquid-crystal dielectric useful in electro-optical display elements comprising a liquid crystalline compound and at least one dyestuff, the improvement wherein at least one dyestuff is an anthraquinone dyestuff of the formula



wherein Hal is halogen, the two radicals R are each H or NH_2 and the alkyl groups is of 1–8 C atoms.

4,532,070

PROCESS FOR THE PREPARATION OF RARE EARTH OXYHALIDE PHOSPHOR

Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 483,335, Apr. 8, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,322
Int. Cl.³ C09K *11/475*
U.S. Cl. 252—301.4 H 3 Claims

1. A process for the preparation of lanthanum and gadolinium oxyhalide phosphor crystals selected from the group consisting of oxychlorides and oxybromides activated with thulium ion consisting essentially of recrystallized phosphor crystals having an average median particle size in the range extending from approximately 3.0 microns diameter up to approximately 9.0 microns diameter along with a more narrow particle size distribution and polyhedral shape comprising the following steps:

(a) heating a mixture of particles of oxides selected from lanthanum and gadolinium oxides, including mixtures thereof, which further contains thulium ion in activator amounts from about 0.0005 to 0.01 mole per mole of the phosphor and an ammonium halide whose halide ion is that of the selected oxyhalide, along with sufficient scandium ion to produce a scandium level in said phosphor from about 0.001 to 0.2 mole per mole of the phosphor for a time and temperature sufficient to form the selected oxyhalide phosphor, and

(b) reheating said phosphor with an alkali metal halide flux mixture whose halide ions are that of the selected oxyhalide phosphor to a temperature not exceeding approximately 900° C. for a time sufficient to recrystallize said selected oxyhalide phosphor.

4,532,071

PROCESS FOR THE PREPARATION OF PHOSPHOR

Takashi Nakamura, and Kenji Takahashi, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1983, Ser. No. 525,460
Claims priority, application Japan, Aug. 24, 1982, 57-145489
Int. Cl.[3] C09K 11/465
U.S. Cl. 252—301.4 H 5 Claims

1. A process for the preparation of a divlanet europium activated alkaline earth metal fluorohalide phosphor containing a metal oxide, said phosphor having the formula:

$$M^{II}FX.aM^{I}X'.bM'^{II}X''_2.cM^{III}X'''_3.x'A:yEu^{2+}$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; M^{I} is at least one alkali metal selected from the group consisting of Li, Na, K, Rb and Cs; M'^{II} is at least one divalent metal selected from the group consisting of Be and Mg; M^{III} is at least one trivalent metal selected from the group consisting of Al, Ga, In and Tl; A is at least one metal oxide selected from the group consisting of BeO, MgO, CaO, SrO, BaO, ZnO, Al_2O_3, Y_2O_3, La_2O_3, In_2O_3, SiO_2, TiO_2, ZrO_2, GeO_2, SnO_2, Nb_2O_5, Ta_2O_5 and ThO_2; X is at least one halogen selected from the group consisting of Cl, Br and I; each of X', X'' and X''' is at least one halogen selected from the group consisting of F, Cl, Br and I; a, b and c are numbers satisfying the conditions of $0 \leqq a \leqq 0.5$, $0 \leqq b \leqq 10^{-2}$, $0 \leqq c \leqq 10^{-2}$ and $a+b+c \geqq 10^{-6}$; and x' and y are numbers satisfying the conditions of $0 < x' \leqq 0.5$ and $0 < y \leqq 0.2$, respectively, which process comprises firing a mixture of starting materials comprising an alkaline earth metal halide, a trivalent europium compound and at least one metal oxide source selected from the group consisting of: a metal oxide subgroup consisting of BeO, MgO, CaO, SrO, BaO, ZnO, Al_2O_3, Y_2O_3, La_2O_3, In_2O_3, SiO_2, TiO_2, ZrO_2, GeO_2, SnO_2, Nb_2O_5, Ta_2O_5 and ThO_2, and a metal compound subgroup consisting of metal compounds easily convertible into said metal oxide under the firing temperature, said firing being carried out in at least two firing stages the fired product from the first firing stage being cooled and pulverized prior to the second firing stage, with the first firing stage being carried out at a temperature of about 600° to 1000° C. under a weak reducing atmosphere for a period of about 0.5 to 12 hours to effect reduction of trivalent europium to divalent europium, and with the second firing stage being carried out at a temperature of about 500° to 800° C. under a weak reducing atmosphere or an inert atmosphere for a period of about 0.5 to 12 hours, said metal oxide source being added prior to the first firing stage and after the first firing stage, with the amount of said metal oxide source added to the fired product of the first firing stage being not less than 1/500 of the amount of said metal oxide source added to said mixture of starting materials prior to the first firing stage, the total amount of metal oxide source added being sufficient to prevent sintering and to enhance the stimulated emission of the resultant phosphor.

4,532,072

PROCESS FOR PRODUCING ALUMINIUM CONTAINING SOLS

David L. Segal, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 14, 1983, Ser. No. 551,204
Claims priority, application United Kingdom, Nov. 25, 1982, 8233690
Int. Cl.[3] B01J 13/00
U.S. Cl. 252—313.1 6 Claims

1. A process for the preparation of a sol of an aluminum compound comprising:

bringing together cold water and an aluminum alkoxide to form a reaction mixture consisting essentially of water and aluminum alkoxide, the amounts of water and aluminum alkoxide in the reaction mixture being such that the water-:alumium ratio is at or near stoichiometric; allowing the water and aluminum alkoxide to react to produce a peptisable aluminum hydrate; and peptising the peptisable aluminum hydrate with a peptising agent in aqueous medium to produce a sol of an aluminum compound.

4,532,073

CANDOLUMINESCENT MATERIAL AND ITS PREPARATION

Aimé Cornu, and Anne-Marie Perroud, both of Meylan, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 25, 1983, Ser. No. 469,582
Int. Cl.[3] F21H 1/02; F21M 3/00; H01M 2/10
U.S. Cl. 252—492 8 Claims

1. A candoluminescent material comprising a mixture of finely divided oxides in the form of a netting identical to a textile, consisting essentially of 80 to 90 molar % of ZrO_2, 5 to 20 molar % of CaO and 1 to 5 molar % of Al_2O_3.

2. The candoluminescent material according to claim 1, which further contains 1 to 5 molar % of MgO.

3. The candoluminescent material according to claim 2, which further contains 0.01 to 1 molar % of one or more oxides selected from the group consisting of iron, praseodymium, manganese and cerium oxides.

4,532,074

CAPACITANCE ELECTRONIC DISC MOLDING COMPOSITION

Mohamed E. Labib, Princeton; Chin-Chun Wang, Mercer County, and Robert F. Poll, Franklin Township, Somerset County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 549,560, Nov. 7, 1983, abandoned. This application Jun. 20, 1984, Ser. No. 622,646
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—511 16 Claims

1. A conductive molding composition for a capacitive electronic disc comprising: a thermoplastic resin comprising a homopolymer or copolymer of vinyl chloride; a sufficient amount of finely divided conductive carbon black to provide capacitive playback of discs prepared therefrom; from about 1 to about 5 percent by weight of a suitable stabilizer comprising an organo-metallic compound containing a member selected from the group consisting of tin, lead; zinc, barium and cadmium; from about 1 to about 4 percent by weight of a suitable plasticizer; and from about 0.3 to about 1.5 percent by weight of isopropyl tri(dioctylpyrophosphato)titanate.

4,532,075

THICK FILM CONDUCTOR COMPOSITION

Barry E. Taylor, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1984, Ser. No. 639,384
Int. Cl.[3] H01B 1/02
U.S. Cl. 252—514 4 Claims

1. A printable thick film conductor composition comprising an admixture of

A. 60–99% wt. finely divided particles of noble metal, noble metal alloy or mixtures thereof and

B. 40–1% wt. inorganic binder consisting essentially of finely divided particles of (1) a boron-free glass corresponding to the formula

$$Bi_4Si_{3-x}Ge_xO_{12},$$

wherein x=0–3, having dissolved therein, basis glass, 0–100 pph PbO, (2) 0–100 pph Bi_2O_3, and (3) 4–100 pph ZnO, provided that when x=0, the glass has dissolved therein at least 1 pph PbO, dispersed in

C. an organic medium which is clean burning at 400°–450° C.

4,532,076

AQUEOUS ANIONIC SURFACTANT CONCENTRATES CONTAINING VISCOSITY REDUCING AGENTS

Karl Schmid, Mettmann; Horst Baumann, Leichlingen, and Hans J. Rommerskirchen, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,672

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3240403

Int. Cl.³ C11D *1/28, 3/26, 3/34;* G05D *24/00*

U.S. Cl. 252—557 11 Claims

1. An aqueous concentrate of an anionic surfactant having a viscosity at 70° C. of not more than about 10,000 mPas comprising:

A. an α-sulfo fatty acid ester; and

B. a viscosity reducing amount of a salt of at least one of the following viscosity regulators: α-sulfoadipic acid methyl ester, α-chlorovaleric acid, cyanoacetic acid, and cyanoacetic acid ethyl ester;

and wherein component A. is present in an excess of 30% by weight, based on the weight of the concentrate.

6. A method for the manufacture of powdery or granular spray dried detergents and cleaners comprising the steps of:

I. forming an aqueous anionic surfactant concentrate having a viscosity at 70° C. of not more than about 10,000 mPas comprising

A. an α-sulfo fatty acid ester; and

B. a viscosity reducing amount of a salt of at least one of the following viscosity regulators: α-sulfoadipic acid methyl ester, α-chlorovaleric acid, cyanoacetic acid, and cyanoacetic acid ethyl ester;

and wherein component A. is present in an excess of 30% by weight, based on the weight of the concentrate; and

II. spray drying the concentrate at a temperature in the range of from about 60° to about 90° C.

4,532,077

THIAZOLINEAZETIDINONE-TYPE COMPOUNDS

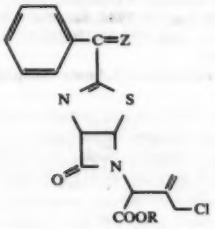
Sigeru Torii; Kenji Uneyama; Hideo Tanaka; Junzo Nokami; Takashi Shiroi, all of Okayama, and Norio Saito, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Filed Aug. 25, 1982, Ser. No. 411,391

Int. Cl.³ C07D *513/04*

U.S. Cl. 260—245.4 2 Claims

1. Thiazolineazetidinone-type compounds represented by the formula



wherein R represents a hydrogen atom, a lower alkyl group, a lower alkyl group replaced with halogen atoms, $CCl(C_6H_5)_2$, a trialkylsilyl group, methyl group replaced with phenyl groups, methyl groups replaced with substituted phenyl groups, said substituent being selected from the group consisting of methyl, ethyl, butyl, propyl, hexyl, methoxy, butoxy, propoxy, halogen and nitro and Z represents O or Cl_2.

4,532,078

REDUCTANT PRECURSOR FOR TELLURIUM IMAGING COMPOSITIONS

Terry T. Yu, Mt. Clemens, and Mei-Rong Yen, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 392,586, Jun. 28, 1982, Pat. No. 4,446,224. This application Apr. 13, 1984, Ser. No. 599,949

Int. Cl.³ C07C *50/12, 50/16*

U.S. Cl. 260—396 R 2 Claims

1. The compound 2,3-diisopropoxy-1,4-naphthoquinone.

2. The compound 2-isopropoxy-1,4-anthraquinone.

4,532,079

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS STARTING FROM OLEFINES OR VICINAL DIHYDROXY COMPOUNDS

Carlo Venturello, and Marco Ricci, both of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 12, 1984, Ser. No. 599,678

Claims priority, application Italy, Apr. 15, 1983, 20604 A/83

Int. Cl.³ C07C *51/285, 51/245*

U.S. Cl. 260—413 8 Claims

1. A process for preparing a monocarboxylic or dicarboxylic acid by oxidative scission of an olefine or a vicinal dihydroxy compound, characterized in that an olefine of the formula $R_1—CH=CH—R_2$ or $R_1—CH=CH_2$ or a vicinal dihydroxy compound of formula $R_1—CHOH—CHOH—R_2$ or $R_1—CHOH—CH_2—OH$ (wherein R_1 and R_2, either equal to or different from each other and, optionally, substituted with groups inert under the reaction conditions, represent hydrocarbon groups such as alkyls having up to 30 carbon atoms; cycloalkyls, optionally branched, having from 3 to 12 carbon atoms; aryls and alkylaryls having from 6 to 12 carbon atoms; moreover, R_1 and R_2 may be bound to each other therefore forming a cyclic alkenyl or cyclic alkyl having up to 12 carbon atoms) are reacted, under vigorous stirring, with H_2O_2 at a temperature between 0° and 120° C. and under a pressure between 1 and 100 atmospheres; and there are used an aqueous phase containing H_2O_2 and an organic phase consisting of a solvent, the olefine or the vicinal dihydroxy compound, and a catalyst; in the case of the olefines, the catalyst being a composition of the formula:

$$Q_3XW_4O_{24-2n}$$

wherein:

Q represents an "onium" $(R_5R_6R_7R_8M)^+$ cation in which M is chosen from the group of N, P, As and Sb;

R_5, R_6, R_7, R_8, equal to or different from each other, represent hydrogen atoms or hydrocarbon groups having a total of from 20 to 70 carbon atoms;

X is an atom of P or As;

n is an integer chosen from among 0, 1 and 2;

and, in the case of the vicinal dihydroxy compounds, the catalyst is chosen from the group consisting of the composition $Q_3XW_4O_{24-2n}$, as defined above, and a catalyst obtained by the reaction of tungstic acid or an alkaline tungstate, with hydrogen peroxide and an "onium" Q^+Y^- salt (wherein Y^- is an inorganic anion) at a pH below 2.

4,532,080

ADHESION PROMOTERS

Jean-Marc Delseth, Gembloux; Daniel E. Mauer, Louvain, and Philippe G. Moniotte, Heron, all of Belgium, assignors to Monsanto Europe, S.A., Brussels, Belgium

Filed Oct. 11, 1983, Ser. No. 540,955

Claims priority, application United Kingdom, Oct. 21, 1982, 8230136

Int. Cl.[3] C07F *15/04, 15/06*

U.S. Cl. 556—139 5 Claims

1. A compound of the formula $(R^1—S—SO_3)_2M^1$ or a hydrate thereof where R^1 represents an organic radical which is a C_{3-20} alkyl group, a C_{2-20} chloroalkyl group, a C_{3-20} alkenyl group, a phenyl (C_{1-16} alkyl) group, a 2,5-dihydroxyphenyl group or a grouping of the formula R^7OOCR^8- where R^7 is a C_{1-12} alkyl group and R^8 is a C_{1-12} alkylene group, and M^1 represents cobalt or nickel.

4,532,081

SYNTHESIS OF 11-DEOXYPROSTAGLANDINS

William L. White, Holliston, Mass., and Peter B. Anzeveno, Zionsville, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 376,984, May 10, 1982, Pat. No. 4,447,636. This application Nov. 2, 1983, Ser. No. 548,130

Int. Cl.[3] C07C *121/48*

U.S. Cl. 260—464 1 Claim

1. 2-(6'-cyano-2'-hexynyl)-2-β,β,β-trichlorocarboethoxy-3-carbomethoxy cyclopentanone.

4,532,082

PREPARATION OF 3-CYANO-2-ALKYLALKANALS

Herbert Toussaint, Frankenthal, and Hans J. Pander, Roedersheim-Gronau, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

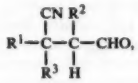
Filed Mar. 1, 1983, Ser. No. 470,932

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207614

Int. Cl.[3] C07C *120/02, 121/34, 121/36*

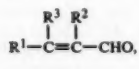
U.S. Cl. 260—465.1 4 Claims

1. A process for the preparation of a compound of the formula I



I

where R^1 and R^2 are identical or different and are each straight-chain or branched alkyl of 1 to 6 carbon atoms and R^3 is hydrogen or alkyl of 1 to 3 carbon atoms, wherein an unsaturated aldehyde of the formula II



II

where R^1, R^2 and R^3 have the above meanings, is mixed with hydrocyanic acid in the presence of from 0.01 to 1.0% by weight, based on the aldehyde, of a basic catalyst, and the reaction mixture is heated at from 100° to 200° C. for from 1 to 120 minutes.

4,532,083

MULTIPLY PROMOTED SN/SB OXIDE CATALYSTS

Dev D. Suresh, Macedonia; Robert K. Grasselli, Chagrin Falls; James F. Brazdil, Lyndhurst, and Frances I. Ratka, Cleveland Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 29, 1982, Ser. No. 437,768

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.[3] C07C *120/14, 120/00*

U.S. Cl. 260—465.3 18 Claims

1. In an ammoxidation process in which propylene or isobutylene together with oxygen and ammonia in the vapor phase are contacted with a tin antimonate catalyst at elevated temperature to yield the corresponding unsaturated nitrile, the improvement wherein said tin antimonate catalyst is free of Fe and is defined by the formula:

$$A_aD_bTe_dSn_eSb_fO_x$$

wherein

A is one or more elements selected from the group consisting of Cu, V, W and Mo,

D is one or more elements selected from the group consisting of Bi, Ti, Ge, Ce, La, Cr, Mn, Mg, Ca, Co, Ni, Nb, Ta, Ag, Zn, Cd, K, Cs, B, Na, P and Eu; and

wherein

a is 0.003 to 30,

b is greater than zero to 30,

d is 0.003 to 30,

e is 0.3 to 60,

f is 0.3 to 60,

$a+b+d \leqq e+f$

x is a number determined by the valence requirements of the other elements present, and

wherein

Sn/Sb is greater than 1/1.1.

4,532,084

METHOD FOR PREPARING A METHYLENE-BIS-(O,O-DIORGANOPHOSPHORODITHIATO)-SUBSTITUTED HINDERED PHENOL

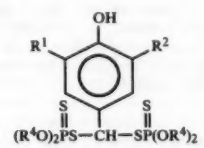
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,537

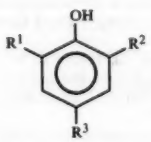
Int. Cl.[3] C07F *9/12*

U.S. Cl. 260—978 9 Claims

1. A method of preparing a product of the formula



wherein R^1 and R^2 are the same or different aliphatic groups containing 1 to 20 carbon atoms and R^4 is selected from hydrocarbyl groups containing 4 to 18 carbon atoms by (1) reacting a hindered phenol of the formula



wherein R^1 and R^2 are defined herein and R^3 is a methyl or

hydroxymethyl group, in the presence of an alcohol, having from 3 to 6 carbon atoms, and a halogen selected from chlorine and bromine, the reaction taking place at from about 5° C. to about 50° C. using a molar ratio of halogen to hindered phenol of from about 0.5 to 1 to about 3 to 1, and (2) without isolating the product thus formed, reacting same with a phosphorodithioic acid of the formula

$(R^4O)_2PSSH$

wherein R^4 is defined herein, this latter reaction being run at from about 30° C. to about 160° C. using a molar ratio of phosphorodithioic acid to product of reaction (1) of from about 1.25 to 1 to about 2.6 to 1.

4,532,085

PHOSPHATE ESTER RECOVERY

Stanley B. Mirviss, Stamford, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 5, 1983, Ser. No. 511,072
Int. Cl.³ C07F 9/09
U.S. Cl. 260—990 **12 Claims**

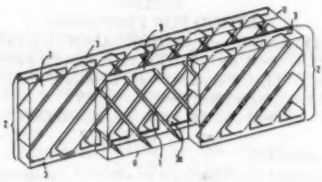
1. A method of recovering phosphate esters from distillation residues of phosphate ester production containing polyaryl ethers and condensed phosphate impurities comprising treating the residues with a hydrocarbon solvent to extract the esters and thereafter recovering the extracted esters from the solvent.

4,532,086

PACKING MADE OF ONE-PIECE LAYERS

Raymond Pluss, Klein Andelfingen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 12, 1982, Ser. No. 397,435
Claims priority, application Switzerland, Jul. 30, 1981, 4923/81
Int. Cl.³ B01D 53/18, 3/24; B01F 5/06; F28F 25/08
U.S. Cl. 261—94 **10 Claims**



1. A packing for mass transfer, direct heat exchange or mixing comprising a plurality of vertically disposed parallel layers, each said layer having a plurality of inclined parallel deflecting surfaces and at least one bridge at one end of a layer connecting said deflecting surfaces of said respective layer together, said deflecting surfaces of one layer being disposed in criss-crossing relation to said deflecting surfaces of an adjacent layer to form criss-cross flow channels disposed in laterally open relationship from one layer to another.

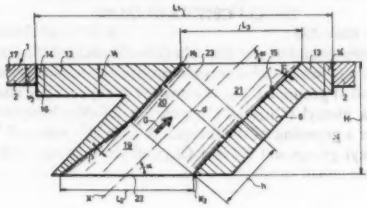
4,532,087

PLATE FOR COLUMNS PERFORMING DISTILLATION AND/OR ABSORPTION PROCESSES

Imre Boronyák, and László Gyökhegyi, both of Budapest, Hungary, assignors to Kozponti Valto es Hitelbank RT., Budapest, Hungary

Filed Dec. 13, 1983, Ser. No. 560,827
Claims priority, application Hungary, Dec. 23, 1982, 4151/82
Int. Cl.³ B01F 3/04
U.S. Cl. 261—114 JP **15 Claims**

1. Plate for columns performing distillation and/or absorption processes, having through openings in the plate body provided with an inlet weir and with an outlet weir, characterized in that in the openings there are fixed inserts (**8** to **12**; **30**) each comprising a through hole (**15**; **24**) containing an inlet zone (**19**; **25**) having, regarding the flow direction of the vapour and/or gas, an inwardly decreasing cross section, an intermediate cylindrical zone (**20**; **26**) connected thereto, and as a continuation thereof, an outlet zone (**21**; **27**) having an



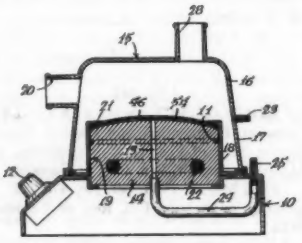
outwardly increasing cross section; the plate body (**2**) and the upper surface of the inserts (**8-12**; **30**) are aligned in a common or essentially common plane, and that at least some of the inserts (**8** to **12**; **30**) have through holes (**15**; **24**) with their geometrical axis (x) being inclined under an acute angle (α) to the upper plane of the plate body (**2**).

4,532,088

HEATED RESPIRATORY THERAPY HUMIDIFIER

Kenneth G. Miller, Palatine, Ill., assignor to Inspiron Corporation, Rancho Cucamonga, Calif.

Filed May 19, 1983, Ser. No. 496,103
Int. Cl.³ B01F 3/04
U.S. Cl. 261—142 **7 Claims**



1. A humidifier assembly for humidifying a breathable gas, said humidifier assembly comprising

a housing;

heater means mounted on said housing, said heater means having a generally horizontally disposed heater surface and being adapted to receive liquid water in a direct heat transfer relationship with said heater surface;

liquid water supply means communicating with the heater means;

a hollow shell on the housing, defining a humidification chamber and having an inlet for a breathable gas and an outlet for humidified breathable gas; and

hydrophobic filter means in the humidification chamber positioned in juxtaposition with said heater surface for passing water vapor into the breathable gas;

said hydrophobic filter means being situated adjacent said heater surface, said liquid water supply means communicating with the heater means to supply liquid water to the heater surface from below the filter means so that only water vapor passes upwardly through the filter means into the humidification chamber and further including a liquid water passageway through the heater means, and said heater means being provided with a valve means within

the liquid water passageway for closing the passageway when the filter means is not in place.

4,532,089

METHOD OF PREPARING GIANT SIZE LIPOSOMES

Robert C. MacDonald, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Jan. 14, 1984, Ser. No. 570,950
Int. Cl.[3] B01J *13/02;* A61K *9/52*
U.S. Cl. 264—4.3 17 Claims

1. An improvement in the method of treating aqueous dispersions of small unilamellar vesicles (SUV) to obtain vesicles of enlarged size, said SUV having been prepared by hydration of a bilayer-forming lipid, and thereafter subjecting said aqueous dispersion to at least one cycle of freezing and thawing, wherein the improvement comprises:

(a) having present in said SUV dispersion prior to said freeze-thaw cycle at least a 0.1 molar concentration of a crystallizable polar compound plus any additional substance desired to be entrapped in large vestices;

(b) then subjecting the dispersion to repeated freeze-thaw cycles in which the temperature reduction in the freezing step is sufficient to crystallize substantially all of the water, said freeze-thaw cycles being repeated until the resulting vesicles are in a generally aggregated form and contain entrapped solution of increased polar compound concentration as well as other substances desired to be entrapped; and then

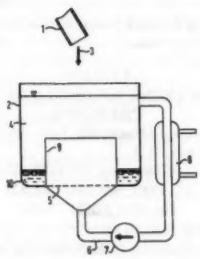
(c) dialyzing the resulting vesicles against an aqueous hypoosmotic medium causing the vesicles to imbibe water, said dialysis being continued until said aggregated vesicles imbibe sufficient water to reform into enlarged unilamellar vesicles.

4,532,090

METHOD AND APPARATUS FOR THE MANUFACTURE OF HIGH PURITY SILICON GRANULATE

Wolfgang Dietze, and Hans J. Fenzl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,307
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 3223821
Int. Cl.[3] B29C *6/00*
U.S. Cl. 264—14 5 Claims



1. Method of manufacturing silicon granules from molten silicon obtained by reduction of quartz with carbon by solidification without contamination of the silicon, which comprises, maintaining a liquid body substantially free of impurities which will contaminate molten silicon poured into the body in a vessel in which the silicon will settle at the bottom, said vessel containing a partition extending from the bottom of the vessel to a height below the level of the body of liquid dividing the body of liquid into an inner region surrounded by the partition and an outer region extending from the partition of the inner region to the wall of the vessel, pouring the molten silicon into the body of liquid to solidify and granulate the silicon with the inflowing silicon moving downwardly into the inner region, at least during pouring of said silicon melt into the liquid body, withdrawing a portion of the liquid in the body from the body at a point remote from the point of introduction of the molten silicon into the liquid body and recirculating the portion of liquid into the body at the bottom of the inner region to flow upwardly against the downwardly moving inflowing silicon melt to concomitantly promote the granulate formation and to float the silicon granules from the inner region up over the partition and downwardly into the outer region to facilitate collection and recovery of the silicon granules.

4,532,091

METHOD OF PRODUCING PERMEABLE, POROUS MOLDED BODIES OF SILICON CARBIDE

Francisco J. Dias, Jülich; Marian Kampel, Heinsberg-Oberbruch, and Hartmut Luhleich, Düren, all of Fed. Rep. of Germany, assignors to Kernforschungsalage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,657
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305529
Int. Cl.[3] C01B *31/36*
U.S. Cl. 264—29.5 12 Claims

1. Method of producing permeable porous molded bodies of silicon carbide, comprising the steps of:

molding a green-state precursor body from a composite powder made of carbon particles, silicon particles, from 0 to 70% by weight of silicon carbide particles, and a cokable organic binder;

breaking up said precursor body into a coarse granulate of a principal grain size in the range from 0.2 to 10 mm;

obtaining from said granulate a fraction thereof of limited size range, said limited size range not exceeding a 2:1 ratio between the largest and smallest granules;

molding a second green-state body from said granulate fraction, with application of pressure which is selected from relatively light to heavy to produce the desired permeability of the silicon carbide body;

coking said organic binder by heating said second green-state body up to a temperature in the range between 600° and 1000° C. in vacuum or in an inert atmosphere, and

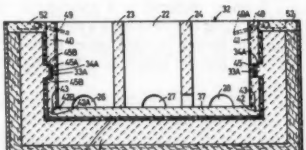
converting the carbon and silicon of said body into silicon carbide by rapidly heating up said body, after the coking of said organic binder, to a temperature between 1400° and 1900° C. in an inert atmosphere.

4,532,092

METHOD OF MAKING A VESSEL FOR MOLTEN METAL

Ants Nömtak, Tegnervägen 8, S-802 28 Gävle, Sweden

Division of Ser. No. 306,393, May 20, 1983, Pat. No. 4,399,981.
This application May 20, 1983, Ser. No. 496,557
Claims priority, application Sweden, Oct. 1, 1980, 806866
Int. Cl.[3] B28B *1/16;* F27D *1/16*
U.S. Cl. 264—30 1 Claim



1. A method of making a vessel for molten metal, said vessel comprising a box-like inner vessel having bottom and side walls formed of rigid heat-resistant panels which are sealingly

joined together along confronting edge surfaces at the inside corners defined by the bottom and side walls, and an insulation covering the outer sides of the bottom and side-wall panels of the inner vessel, said method comprising the steps of

applying to the outer sides of said panels a resilient layer of heat-resistant fibrous material,

placing said panels in their proper final positions relative to one another substantially without securing them together,

generating a reduced pressure in the inner vessel to cause the panels to be clamped together by the pressure of the surrounding atmosphere,

while maintaining said reduced pressure placing the inner vessel with said resilient layer in a casing interiorly lined with a heat insulation with the bottom and all side walls of the inner vessel spaced from said insulation,

filling the spacing between the heat insulation of said casing and the resilient layer of said bottom and side walls of said inner vessel with a refractory casting compound, and

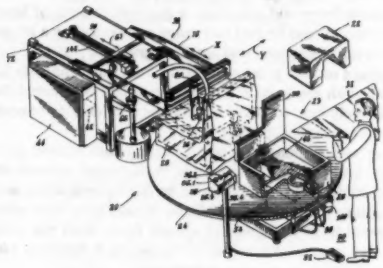
causing said casting compound to set and shrink and thereby clamping together the panels of said inner vessel.

4,532,093

METHOD AND APPARATUS FOR THE MANUFACTURE OF MOLDED PACKINGS

Michael P. O'Malley, Stratford; David E. Henderson, Darien; Mark J. Cable, Shelton, all of Conn., and James E. Hefferon, Keene, N.H., assignors to International Packaging Systems Inc., Norwalk, Conn.

Filed Apr. 14, 1983, Ser. No. 485,062
Int. Cl.³ B29D *27/04*; B29C *1/04*
U.S. Cl. 264—40.1 **21 Claims**



1. A method for manufacturing molded upper and lower packings comprising the steps of:

rotating at least a first and a second mold plug respectively located in first and second mold boxes for respectively forming upper and lower packings between at least first and second work stations; lining the first mold plug and inner surface of the first mold box with a separator sheet at one work station;

rotating said lined first mold box enclosing a mold plug to another work station while rotating the second mold box enclosing a mold plug to a work station;

supplying a foaming material in a preselected pattern into said lined first mold box enclosing a mold plug at the other work station to form a molded upper packing;

closing the mold box to which said foaming material has been supplied;

rotating the mold box to which foaming material has been supplied away from the other work station;

permitting the foaming material to fully foam and to cure

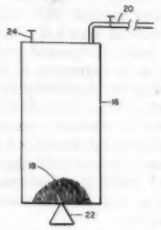
removing a molded upper packing at a location that is away from the one work station where the foaming material is being supplied and during the formation and removal of said upper packing in the first mold box, forming a lower packing within the second mold box by placing a separator sheet over the mold plug therein and inner surface of the second mold box to form a lining therefore at one work station and supplying foaming material at another work station, closing and rotating the second mold box and removing the lower packing therefrom at a location that is away from the station where foaming material is supplied into the second mold box.

4,532,094

THERMOPLASTIC FOAM MOLDING

Wen-Pao Wu, Victor, and Charles M. Krutchen, Pittsford, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,642
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—53 **14 Claims**



1. A method for preparing a molded thermoplastic foam structure comprising:

(a) impregnating a thermoplastic polymer in particulate form, which polymer is capable of imbibing a blowing agent, with an amount of blowing agent sufficient to foam said polymer to a density of less than about 20 lbs/ft^3, to yield at least a substantially free flowable particulate combination;

(b) partially filling a mold with said free flowable particulate combination;

(c) pressurizing said mold to prevent any substantial vaporization of said blowing agent during subsequent polymer melting;

(d) heating said polymer to at least a flowable state;

(e) releasing the mold pressure to permit foaming of said melt and expansion of the foamed polymer within the mold; and

(f) removing the molded foam structure.

4,532,095

METHOD OF MAKING A VIDEO DISC FROM A DISC PREFORM

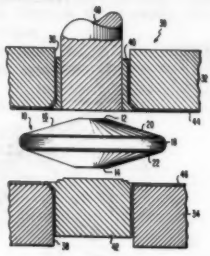
Michael L. McNeely, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 66,769, Aug. 15, 1979,. This application Oct. 29, 1980, Ser. No. 201,828
Int. Cl.³ B29D *17/00*
U.S. Cl. 264—107 **4 Claims**

1. In a method of making a recorded disc wherein a preform of plastic material is placed between a pair of spaced apart heated molds and the molds are closed against the preform causing the plastic to flow and fill the mold cavity and define the disc contour, the improvement comprising:

the preform is a body having substantially flat top and bottom surfaces of the same peripheral dimension and a peripheral surface between the top and bottom body surfaces, said peripheral surface having a first portion of a peripheral dimension greater than the peripheral dimensions of the top and bottom surfaces and second and third portions extending from said first portion to the top and bottom surfaces respectively, said second and third portions each being conical so as to have a peripheral dimen-

sion which decreases from that of the first portion to that of the top and bottom surfaces respectively, and the pre-



form is placed between the molds so that the molds first contact the top and bottom surfaces.

4,532,096

METHOD OF SHAPING ARTICLES USING SHAPING SURFACES HAVING RELEASE AGENT COATING

Ben R. Bogner, 1144 N. President, Wheaton, Ill. 60187, and Frank C. Grant-Acquah, 3715 N. Salem Walk, Northbrook, Ill. 60062

Filed May 9, 1983, Ser. No. 493,092
Int. Cl.³ B22C *3/00, 9/02;* B29J *5/00*
U.S. Cl. 264—109 **18 Claims**

1. A method of forming or shaping a resin-bound mass in or from shaping means having shaping surfaces and releasing the shaped resin-bound mass from the shaping surfaces, which comprises

coating the shaping surfaces of the shaping means with an improved, substantially stable, alcoholic dispersion or solution of a release coating composition suitable for repeated use;

said coating composition comprising a substantially stable alcoholic dispersion or solution of a substantially pure silanol of the formula $RSi(OH)_3$ or partial condensate of one or more silanols of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical, and the gamma-methacryloxypropyl radical.

heating the coated shaping surfaces of the shaping means for sufficient time to convert the coating thereon to a stable, cured, abrasion-resistant release coating;

placing a curable resin-bound mass of solids to be shaped against the release-coated shaping surfaces;

curing the resin-bound mass; and

separating the cured resin-bound mass from contact with the release-coated shaping surfaces.

4,532,097

METHOD OF FORMING FIBER REINFORCED SYNTHETIC MATERIAL WHEEL

Vernon A. Daniels, Canton; Joonmin Park, Farmington Hills, and Steven Ivanyi, Walled Lake, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,674
Int. Cl.³ B32B *31/04*
U.S. Cl. 264—258 **19 Claims**

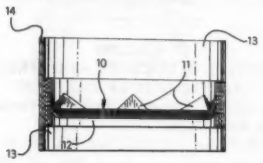
1. A method of making a fiber reinforced synthetic material automotive vehicle wheel, which method comprises:

(A) providing a compression moldable pre-form of a synthetic material wheel, which pre-form comprises:

a substantially planar spider portion comprising random, chopped fiber reinforced resin;

a first tubular section comprising fiber reinforced resin sheet surrounding said spider portion about an axis substantially normal to the plane of said spider portion; and

a second tubular section comprising fiber reinforced resin sheet surrounding and substantially coaxial with said first tubular section, extending axially in both directions beyond said first tubular section, said fiber reinforced resin



sheet of said first tubular section and said second tubular section each comprising random, chopped fiber and continuous fiber; and

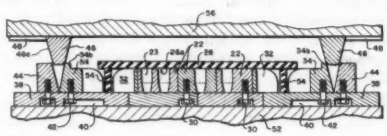
(B) compression molding said pre-form at a temperature of about from 275° to 325° F., at a pressure of about from 700 to 1500 psi, for a time of about from 3 to 6 minutes.

4,532,098

METHOD FOR FABRICATING NON-LINEAR SIDE WALL CONVEYOR BELTING

Clarence R. Campbell, 6150 S. Jordan Canal Rd., Salt Lake City, Utah 84118; Elliot S. Mickelson, 3357 West 4630 South, and Steven A. Baumgartner, 3443 Kathy Ave., both of West Valley City, Utah 84119

Filed Dec. 2, 1983, Ser. No. 557,633
Int. Cl.³ B29H *7/22*
U.S. Cl. 264—320 **7 Claims**



6. A method for fabricating conveyor belting having undulated side walls, comprising the steps of:

providing a mold adapted for forming side wall material into an undulated shape and for supporting said side wall material during curing together with uncured conveyor belt material so as to produce undulated side wall conveyor belting, said mold having respective fixed inner side wall mold components conforming in shape to a suitable inner undulated side wall configuration, and associated movable outer side wall mold components conforming in shape to a suitable outer undulated side wall configuration, said mold further including backing support means fixed at a position adjacent to an open position of the outer side wall mold components;

moving said outer side wall mold components to an open position sufficiently spaced from the inner side wall mold components to permit placement of substantially straight uncured side wall material adjacent to said inner side wall mold components;

placing uncured side wall material adjacent the inner side wall components;

placing uncured conveyor belt material into said mold;

positioning wedge means for insertion between said fixed backing support means and respective outer side wall mold components;

inserting said wedge means in order to cause the outer side wall mold components to be displaced from an open position adjacent to said backing support means to a closed

position wherein the inner and outer side wall mold components are spaced apart at a distance corresponding to a suitable side wall thickness, thereby forming the uncured side wall material into an undulated shape; and

simultaneously curing the undulated side wall material and the conveyor belt material under suitable conditions of heat and pressure so as to form conveyor belting having undulated side walls unitarily bonded thereto.

4,532,099

CONDUCTIVE STRUCTURE AND METHOD OF MANUFACTURE THEREOF

Isamu Kaji, 48-38, Higashino-Yashiro, Yamashina, Higashiyama-ku, Kyot, Japan

Filed Mar. 10, 1983, Ser. No. 474,191

Claims priority, application Japan, Mar. 10, 1982, 57-37795; Mar. 26, 1982, 57-49813; Jul. 14, 1982, 57-122388

Int. Cl.³ B29D *9/00, 9/04;* **B32B** *27/20*

U.S. Cl. 264—510 **5 Claims**

1. A method of manufacturing a conductive structure which comprises:

subjecting a non-woven fabric containing

0.01 to 99% by weight of copper-adsorption fibers having a cyano radical and reduced after being subjected to adsorption of copper ion thereto and

99.99 to 1% by weight of thermally fusible fibers and a thermoplastic resin molded non-fibrous material in the form of sheet, film or board to fusion bonding under pressure at a temperature exceeding a melting point of said thermally fusible fibers so that said thermally fusible fibers are melting to form a layer translucent enough to allow the non-fibrous material to be perceived therethrough, said copper-adsorption fibers maintaining initial appearance thereof and being fused to the surface of said thermoplastic resin molded non-fibrous material.

5. A method of manufacturing a conductive structure as set forth in claim 1, wherein there is provided a structure in which copper-adsorption fibers are fused to the surface of the thermoplastic resin molded non-fibrous material thereof by inserting the non-woven fabric into a mold and then pressing and fusing a heated and softened thermoplastic resin molded non-fibrous material to the non-woven fabric according to a vacuum molding or deep drawing molding method.

4,532,100

BLOWN NYLON FILM AND PROCESS FOR THE PREPARATION THEREOF

Gerald M. Lancaster, Freeport, and Stephen M. Hoenig, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1983, Ser. No. 492,065

Int. Cl.³ B29D *7/24*

U.S. Cl. 264—564 **21 Claims**

1. A process for the preparation of a biaxially oriented monolayer polyamide film structure which process comprises preparing an intimate mixture consisting essentially of from about 1 to about 50 parts by weight of a random ethylene/ethylenically unsaturated carboxylic acid copolymer with from about 50 to about 99 parts by weight of a polyamide resin and fabricating said admixture into a monolayer blown film structure.

4,532,101

ARTICULATED LIMITER BLADE FOR A TOKAMAK FUSION REACTOR

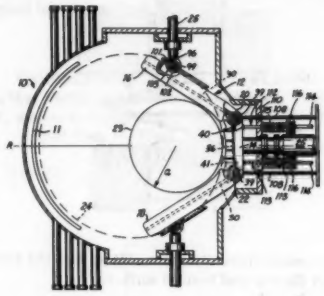
David W. Doll, San Diego, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 21, 1982, Ser. No. 435,791

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—136 **22 Claims**

1. In a fusion reactor having a generally toroidal vacuum chamber wherein is confined a plasma having an outer boundary and wherein said vacuum chamber and said plasma are characterized as having respective major and minor radii, a limiter blade for defining the outer boundary of said plasma comprising a plurality of blade sections including a central blade section arranged generally perpendicularly to the major



radius of the vacuum chamber and movable along said major radius, and an upper blade section and a lower blade section connected pivotally to respective end portions of said central blade section for pivotal movement within said vacuum chamber for adjusting to the minor radius of a plasma therewithin.

4,532,102

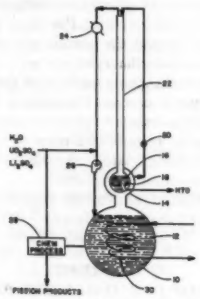
PRODUCING TRITIUM IN A HOMOGENOUS REACTOR

William E. Cawley, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,107

Int. Cl.³ G21G *1/02;* **G21C** *1/24*

U.S. Cl. 376—185 **2 Claims**



1. A method for producing tritium comprising:

(a) placing a fuel solution in an aqueous homogenous nuclear reactor, said fuel solution consisting essentially of an aqueous solution of UO_2SO_4 and $Li_2{}^6SO_4$;

(b) causing a neutronic chain reaction to occur in said fuel solution;

(c) reacting said $Li_2{}^6SO_4$ with neutrons from said chain reaction to produce tritium;

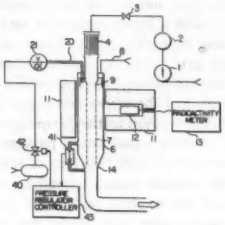
(d) operating a distillation column with heat produced by said chain reaction; and

(e) stripping with said distillation column said tritium in the form of tritiated water from said aqueous fuel.

4,532,103
APPARATUS FOR MEASURING CONCENTRATION OF RADIOACTIVITY

Hiroshi Kitaguchi, Ibaraki; Masashi Kudo, Hitachi, and Masaaki Fujii, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,549
Claims priority, application Japan, Dec. 1, 1980, 55-167984
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—245 8 Claims



1. An apparatus for measuring concentration of radioactivity in a fluid comprising:

a radioactivity measurement pipe arranged to extend vertically;

means for supplying said fluid into said measurement pipe in such a manner that said fluid flows down through said measurement pipe along the axis of said measurement pipe without contacting the inner surface of the latter;

means disposed at the outside of said measurement pipe for measuring the radioactivity concentration in said fluid flowing through said measurement pipe;

means for supplying cleaning water to flow down and form a water layer on the inner surface of the measurement pipe;

a gas layer between the water layer and the fluid flowing along the axis of the measurement pipe;

a gas supply pipe, separate from said means for supplying cleaning water, supplying gas to the gas layer, provided with a check valve which opens to admit gas when gas pressure in the measurement pipe is lower than ambient gas pressure and which closes when gas pressure within the measurement pipe is greater than ambient gas pressure so as to maintain the gas pressure at least at atmospheric pressure; and

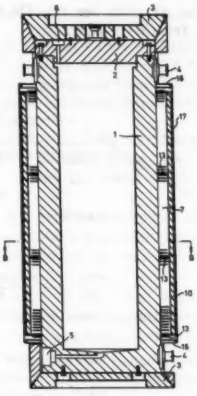
an outlet pipe provided at the down stream end of the measurement pipe for discharging the fluid to the outside of the measurement pipe.

4,532,104
TRANSPORT AND STORAGE FLASK FOR NUCLEAR FUEL

Sydney Wearden, Bold, and John A. Gatley, Knutsford, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Mar. 24, 1982, Ser. No. 361,210
Claims priority, application United Kingdom, Apr. 6, 1981, 8110642
Int. Cl.³ G21F *5/00*
U.S. Cl. 376—272 4 Claims

1. A flask for the transport and storage of irradiated nuclear fuel comprising a hollow cylindrical container having an axis, cooling fins on the exterior of the container, said cooling fins being axially spaced apart along said axis and extending about the circumference of the container, an outer jacket of neutron shielding material substantially surrounding the fins, and spacers carried by the jacket in embracing contact with but unconnected to the exterior of the container and passing between axially adjacent cooling fins to support the jacket on the container and space the jacket radially from the extremities of the fins to provide a space for through-flow of air about the container and fins for cooling, said jacket being releasable and removable from said container as an integral unit, said jacket

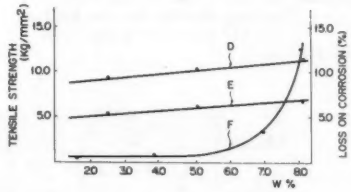


comprising at least two portions, there being a hinged interconnection at one pair of adjacent sides of said portions and an adjustable interconnection at another pair of adjacent sides of said portions.

4,532,105
CASTING ALLOY RESISTANT TO CORROSION AND WEAR AT ELEVATED TEMPERATURES

Saburo Kunioka, Kawagoe; Kiwamu Okuma, Kooriyama; Tsunehiro Haga, Tokyo, and Hatsuo Kawaguti, Saitama, all of Japan, assignors to Shinokoku Steel Corporation, Kawagoe; Nitto Boseki Co., Ltd., Fukushima and Paramount Glass Mfg., Co., Ltd., Kooriyama, all of, Japan

Continuation-in-part of Ser. No. 422,963, Sep. 24, 1982, abandoned. This application May 29, 1984, Ser. No. 614,992
Claims priority, application Japan, Dec. 8, 1981, 56-197121
Int. Cl.³ C22C *19/05*
U.S. Cl. 420—451 2 Claims

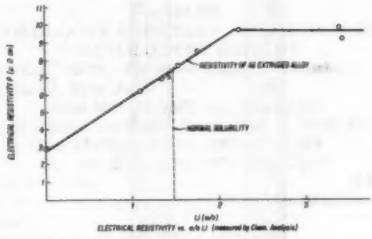


1. A high temperature corrosion-resistant and wear-resistant casting alloy used for preparing rotatory cylinder of glass fibers spinning which consists essentially of 0.08 to 0.8 percent by weight of C, 15 to 35 percent by weight of Cr, 1 to 5.5 percent by weight of W, 0.10 to 0.25% by weight of Ti, 0.10 to 0.25% by weight of Zr, about 1 percent by weight of Nb, and the remainder constituted by Ni and impurities unavoidably carried into the alloy.

4,532,106
MECHANICALLY ALLOYED DISPERSION STRENGTHENED ALUMINUM-LITHIUM ALLOY

Joseph R. Pickens, Beltsville, Md., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jul. 31, 1980, Ser. No. 174,182
Int. Cl.[3] C22C *21/00*
U.S. Cl. 420—528 20 Claims



1. A dispersion strengthened mechanically alloyed aluminum-base alloy, consisting essentially, by weight, based on consolidated form of from about 1.7% up to about 3% lithium, from about 0.4% up to about 1.5% oxygen, from about 0.25% up to about 1.2% carbon, and the balance essentially aluminum, said alloy being characterized in consolidated form by a combination of a room temperature yield strength of at least about 55 ksi, an elongation of at least 2%, a specific modulus of at least about 114×10^6 inches and resistance to corrosion, with the proviso that when the yield strength is less than about 60 ksi, then the % elongation is greater than 3%.

4,532,107
REAGENT TEST DEVICE

M. Sultan Siddigi, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

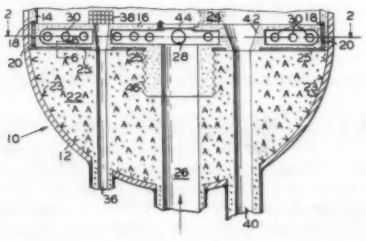
Filed Mar. 26, 1984, Ser. No. 593,535
Int. Cl.[3] G01N *21/78, 33/52*
U.S. Cl. 422—56 8 Claims

1. Reagent test device comprising multiple reagent carrier matrices attached in spaced relationship to one side of a supporting substrate, wherein the substrate is a hydrophilic polyester screen material having a nominal filter rating of from about 80 to about 130 microns.

4,532,108
REFRACTORY GAS DISTRIBUTOR FOR FLUIDIZED BED REACTORS

Charles Becht, IV, Morristown, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 29, 1983, Ser. No. 527,113
Int. Cl.[3] B01J *8/44;* F27B *15/10*
U.S. Cl. 422—143 8 Claims

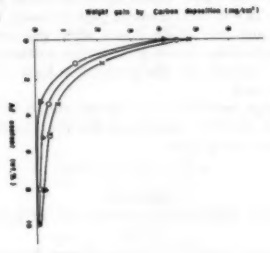


1. A non-metallic gas distributor grid for a high temperature fluidized bed reactor comprising a generally circular cast refractory ceramic grid plate extending across substantially the entire width of a lower portion of the reactor to define a bottom head space therebelow, said grid plate including a plurality of concentric spaced annular passageways communicating with a plurality of interconnecting radial spoke passageways and a plurality of upwardly disposed gas outlet passages communicating with said annular and spoke passageways, all of said passageways and said passages being integrally formed in said grid plate during casting thereof, a grid support comprising a mass of castable refractory substantially filling said bottom head space and having an upper surface in supporting surface contact with a lower surface of said grid plate, means integrally joining a portion of the lower surface of said grid plate with said grid support, means defining a plurality of pressure equilization passageways, between the lower surface of said grid plate and the upper surface of said grid support, extending radially outward to the periphery of said grid plate, whereby said pressure equalization passageways are in fluid communication with an upper surface of said grid plate, and a central gas inlet conduit means extending upwardly through said grid support intersecting said radial spoke passageways, whereby the gas pressure drop across the grid plate required for bed fluidization is substantially eliminated and the lower surface of said grid plate is substantially continuously supported by said grid support across the reactor diameter.

4,532,109
PROCESS FOR PROVIDING AN APPARATUS FOR TREATING HYDROCARBONS OR THE LIKE AT HIGH TEMPERATURES SUBSTANTIALLY WITHOUT CARBON DEPOSITION

Keikichi Maeda, and Takahiro Iijima, both of Yokohama, Japan, assignors to JGC Corporation, Tokyo, Japan

Continuation of Ser. No. 341,214, Jan. 21, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 575,049
Int. Cl.[3] B01J *19/02*
U.S. Cl. 422—240 4 Claims

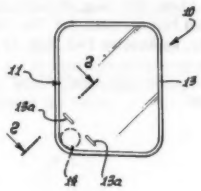


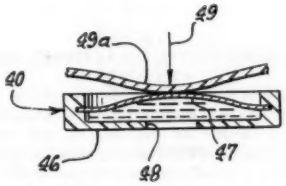
1. A method of protecting from carbon deposition an apparatus made of a base steel which has 5–25% chromium and 20–35% nickel, and preventing the migration of iron and nickel to the surface of the apparatus in which hydrocarbons, derivatives thereof or a carbon monoxide containing fluid are subjected to high temperature, which consists of: making at least the portions to be contacted with said hydrocarbons, derivatives thereof or with said high temperature fluid of a specific alloy base steel having 4.5–6.5% by weight of aluminum and at least 5% chromium and oxidizing said apparatus with an oxidizing gas before or upon contact with the said hydrocarbons, derivatives thereof or carbon monoxide containing fluids by heating to 1100° C. to form an aluminum-containing oxide film on the surface of at least said portions of the said apparatus and inhibiting carbon deposition on said portions of the apparatus.

4,532,110
PROTECTED TRIGGER TO CONTROLLABLY INITIATE CRYSTALLIZATION

Imants P. Kapralis, 443020 S. Punta Del Este Dr., Hacienda Heights, and Harry Krukle, 7023 Bevis Ave., Van Nuys, both of Calif. 91405, assignors to Imants P. Kapralis; Harry Krukle and William W. Haefliger, all of Pasadena, Calif., part interest to each

Filed Dec. 27, 1983, Ser. No. 565,699
Int. Cl.³ B01D *9/02*
U.S. Cl. 422—245 **15 Claims**





1. For use in initiating crystallization of a supercooled salt solution, a trigger comprising

(a) a thin, metallic strip having a perimeter,

(b) said strip having a multiplicity of openings formed therein, each opening characterized as having opposed edges which face one another in near touching relation,

(c) the strip further characterized as having configurations between which it is bendable for causing said edges to initiate progressive exothermic crystallization of said salt in the solution,

(d) and a non-metallic, cup-shaped frame extending about said perimeter and receiving and mounting said strip, the frame defining openings at opposite sides of the strip, one opening larger than the other,

(e) the frame having a side wall which supports the periphery of the metallic strip so that a central portion of the strip may be flexed relative to said side wall.

4,532,111
RECOVERY OF CATALYSTS AS W, MO OR RU OXYCHLORIDES IN LIQUID PHASE CHLORINATION OF PYIRIDINE COMPOUNDS

Paula L. Humphreys, San Ramon, and Jonathan A. Okorley, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 19, 1984, Ser. No. 632,182
Int. Cl.³ C01G *55/00, 41/00, 39/00;* **C07D** *213/26*
U.S. Cl. 423—22 **2 Claims**

1. A process for the recovery of tungsten, molybdenum or ruthenium chloride catalysts employed in the liquid phase chlorination of pyridine compounds which comprises treating the reaction mass with oxygen or air for a time sufficient to form solid tungsten, molybdenum or ruthenium oxychloride compounds and thereafter separating said solid compounds from the liquid phase.

2. Process of claim 1 wherein the metal chloride catalyst is tungsten hexachloride.

4,532,112
PROCESS FOR PRODUCING ANTIMONY TRIOXIDE HAVING A LOW ALPHA-RAY STRENGTH

Hiroshi Nakahira, Koganei, and Shigeki Kubo, Niihama, both of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,256
Claims priority, application Japan, May 24, 1983, 58-89960
Int. Cl.³ C01B *29/00*
U.S. Cl. 423—87 **14 Claims**

1. A process for purifying a sample of antimony trioxide which contains an alpha ray-producing contaminant substance so as to reduce the alpha ray strength of said sample, said process consisting of the steps of

(a) mixing at least an equivalent amount of concentrated hydrochloric acid with said sample of antimony trioxide so as to form an aqueous solution of antimony chloride and an undissolved residue,

(b) separating said undissolved residue from said aqueous solution of antimony chloride,

(c) adding at least 10 times as much water by volume to said aqueous solution of antimony chloride to form a mixture,

(d) heating said mixture to at least 60° C.,

(e) stirring said heated mixture to cause antimony trioxide to precipitate, leaving a supernatent liquid,

(f) separating said precipitated antimony trioxide from the supernatent liquid,

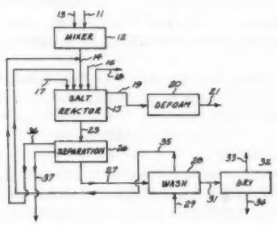
(g) washing said separated antimony trioxide in at least one stage with at least 10 times as much warm water by weight, said warm water having a temperature of at least 60° C., and

(h) drying said washed antimony trioxide to provide the purified antimony trioxide.

4,532,113
IRON CHLORIDE WASTE TREATMENT IN MOLTEN SALT

Tze Chao, Newark, Del., and Jack K. Nyquist, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 498,470, May 26, 1983, abandoned. This application Sep. 6, 1983, Ser. No. 529,622
Int. Cl.³ C01F *11/24;* **C01G** *49/02*
U.S. Cl. 423—138 **7 Claims**



1. A process of treating with limestone iron chloride wastes generated in an ore chlorination wherein the treatment reaction is carried out at from about 50° C. to about 200° C. in a molten bath of $CaCl_2.xH_2O$ wherein x is from 3–6 to form a mixture of iron oxide and calcium chloride hydrate.

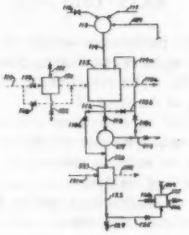
4,532,114
PURIFICATION OF GEOTHERMAL STEAM CONTAINING BORON, ARSENIC OR MERCURY

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 082,647, Oct. 9, 1979, abandoned, which is a division of Ser. No. 938,942, Sep. 1, 1978, Pat. No. 4,202,864, which is a division of Ser. No. 712,170, Aug. 6, 1976, Pat. No. 4,123,506. This application Jun. 22, 1983, Ser. No. 505,027

Int. Cl.³ C01B *35/00, 1/00*

U.S. Cl. 423—210 17 Claims



1. A process for improving the utility of geothermal steam at superatmospheric pressure, said steam containing relatively minor amounts of one or more gaseous impurities consisting of substances comprising boron, arsenic and/or mercury, and also containing at least one of hydrogen sulfide and carbon dioxide, which process comprises:

(a) providing an aqueous liquid medium containing one or more chemical reagents selected from the class of alkaline earth metal compounds capable of interacting with said gaseous impurities to form relatively insoluble or slightly soluble products thereof in the presence of said steam;

(b) contacting at elevated temperature and superatmospheric pressure a flow of said geothermal steam with said aqueous liquid medium and transferring at least a part of one or more of said gaseous impurities from said steam into said aqueous liquid and forming said products therein;

(c) delivering from said contacting the resulting flow of steam at elevated temperature and superatmospheric pressure having substantially all of said hydrogen sulfide and/or carbon dioxide therein but depleted in said transferred impurities; and

(d) discharging from said contacting aqueous liquid having an acid pH and containing dispersed therein said products of said transferred impurities.

4,532,115
METHOD FOR REMOVAL OF POISONOUS GASES

Hiroshi Nishino, Suita, and Toshio Aibe, Kashima, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 17, 1984, Ser. No. 581,367

Claims priority, application Japan, Mar. 3, 1983, 58-34923; Sep. 26, 1983, 58-178412

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 8 Claims

1. A method for removal of at least one hydride of As, B, P, Sb and Se from a gas containing said hydride and substantially not containing oxygen, which comprises contacting the gas with an activated carbon containing:

(1) copper oxide in an amount of 0.1 mg-atom to 3.0 mg-atom as metal per g of activated carbon and

(2) at least one of (a), (b) and (c) selected from the group consisting of

(a) at least one alkali metal compound,

(b) at least one alkaline earth metal compound and

(c) at least one compound of Al, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Cd and Pb,

the total amount of (2) being 0.2 mg-atom to 4.0 mg-atom as metal per g of activated carbon.

4,532,116
PROCESS OF DESULFURIZING GASES WITH AN AMINE-CONTAINING ABSORBENT SOLUTION

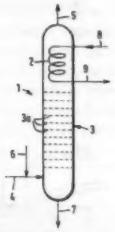
Alexander Doerges; Johann Schlauer; Manfred Kriebel, and Anton Hüde, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,347

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242277

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—226 12 Claims



1. In a process of desulfurizing a gas containing a H_2S and/or COS in a desulfurization zone and finally in a scrubbing zone with an absorbent which contains at least one secondary amine in an organic solvent, wherein the gas is partly desulfurized in said desulfurization zone and thereafter is subjected to fine desulfurization in a scrubbing zone, the improvement which comprises introducing said gas from said desulfurization zone into said scrubbing zone while at an entrance temperature in the range of 25° to 100° C., said gas containing, on an anhydrous basis, H_2S plus COS not in excess of 5 mg per cubic meter and additionally containing said organic solvent and said secondary amine in vaporized form, passing said gas while in said scrubbing zone upwardly in countercurrent to an absorbent solution, indirectly cooling said gas while in said scrubbing zone to a temperature which is at least 20° C. less than the temperature of said gas at its entrance into said scrubbing zone, but not less than 5° C. whereby to form a condensate containing said secondary amine, conducting said condensate downwardly in said scrubbing zone and bringing it in countercurrent contact with upwardly rising gases therein whereby said condensate functions as an absorbent and said condensate is the only absorbent in said scrubbing zone and withdrawing from the lower end of said scrubbing zone a condensate containing at least 10 mols secondary amine per mol of the combined mols of H_2S and COS in the gas introduced into said scrubbing zone.

4,532,117
METHOD FOR RECONDITIONING BACTERIA-CONTAMINATED HYDROGEN SULFIDE REMOVAL SYSTEMS

Dennis D. Delaney, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

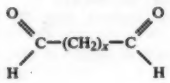
Filed Dec. 20, 1983, Ser. No. 565,113

Int. Cl.³ B01D *53/34;* C01B *17/05;* C09K *3/00*

U.S. Cl. 423—226 18 Claims

1. A method for reconditioning a hydrogen sulfide removal system which employs a regenerable aqueous washing solution capable of absorbing hydrogen sulfide and converting that hydrogen sulfide to elemental sulfur after the system has become contaminated with sulfur-feeding bacteria and for main-

taining such a system in a substantially bacteria-free condition, said method comprising contacting said aqueous washing solution which comprises at least one metal and at least one metal complexing agent with a bactericidal agent comprising an aliphatic dialdehyde of the form:

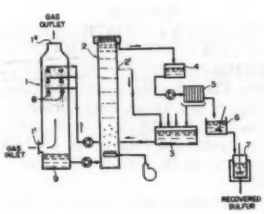


where x is an integer.

4,532,118
PROCESS FOR REMOVAL OF HYDROGEN SULFIDE FROM GASES

Tadaaki Tajiri, and Hitoshi Nishizawa, both of Hyogo, Japan, assignors to Kimura Chemical Plants Co., Ltd., Hyogo, Japan

Filed Mar. 29, 1984, Ser. No. 594,913
Int. Cl.³ B01D *53/34*; C01B *17/05*
U.S. Cl. 423—226 **9 Claims**



1. A process for the removal of hydrogen sulfide from a gas comprising contacting said gas with a solution comprising ferric ions and ferrous ions, said solution further comprising ethylenediamine tetraacetic acid or a salt thereof and triethanolamine or a salt thereof, said solution having a pH in the range of from 7 to 9 and a mole ratio of ferric ion to total iron ions in the range of from 0.60 to 0.90, said mole ratio of ferric ion being measured just after said hydrogen sulfide contacts said solution.

4,532,119
CATALYTIC DESULFURIZATION OF INDUSTRIAL WASTE GASES

Thierry Dupin, Garges-les-Gonesse, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Division of Ser. No. 353,219, Mar. 1, 1982, Pat. No. 4,422,958. This application Nov. 17, 1983, Ser. No. 539,132
Claims priority, application France, Mar. 13, 1981, 81 05029
Int. Cl.³ B01D *53/34*; C01B *17/04, 17/16*
U.S. Cl. 423—230 **22 Claims**

1. In a process for catalytically desulfurizing industrial waste gases containing objectionable/polluting compounds of sulfur comprising at least one of H_2S, SO_2 and organic sulfur compounds, by Claus process reactions to convert said sulfur compounds into elemental sulfur and/or compounds which can be more readily removed, the improvement which comprises employing as the desulfurizing catalyst therefor, a catalyst composition having enhanced mechanical strength and activity, and displaying marked resistance to sulfation, comprising (i) titanium dioxide, and (ii) the sulfate of an alkaline earth metal which is calcium, barium, strontium or magnesium.

4,532,120
SILANE PURIFICATION PROCESS

Isaac L. Smith, and Gunner E. Nelson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 28, 1983, Ser. No. 566,279
Int. Cl.³ C01B *33/04*
U.S. Cl. 423—347 **38 Claims**

1. A process for the removal of phosphine or arsine from previously synthesized silane, said process comprising intimately contacting silane gas containing phosphine or arsine with a liquid mixture consisting essentially of an innocuous reaction medium and an alkali metal aluminum tetrahydride and recovering the purified silane gas.

30. An analytical method for measuring the phosphine and arsine content of a silane sample, said process comprising the steps of intimately contacting the sample with a solution of alkali metal aluminum tetrahydride to react the phosphine and arsine therewith so as to remove at least about 90% of the phosphine and arsine from the silane; hydrolyzing the solution to evolve hydrogen gas from the alkali metal aluminum tetrahydride and re-evolve phosphine and arsine gases in a closed space; and determining the amount of arsine and phosphine concentrated in the hydrogen gas.

4,532,121
PROCESS FOR THE PREPARATION OF FINELY DIVIDED ALUMINAS OR ALUMINA-MAGNESIA SPINELS HAVING HOMOGENEOUS PORE STRUCTURE

Roland Bachelard, Lyons, and Maurice Lamalle, Saint-Genis-Laval, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 373,430, Apr. 30, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 622,401
Claims priority, application France, Jun. 2, 1981, 81 10872
Int. Cl.³ C01F *7/16, 7/30, 7/32*
U.S. Cl. 423—600 **18 Claims**

1. A process for preparing a finely divided alumina from an ammonium-alum based composition comprising the following steps:

(a) mixing an ammonium alum with a sweling agent, and heating said mixture above its fusion temperature, thereby obtaining a dehydrated alum composition having a bulk density less than 0.2kg/dm^3;

(b) calcining the dehydrated material at a first temperature stage of from about 750° to 850° C. and a second temperature stage of from about 900° to 1050° C.; and then

(c) recovering said alumina having a homogeneous unimodal pore structure with maximum pore radii between 4 and 5 mm and a specific area greater than 145 m^2/g.

9. A process for preparing a finely divided non-stoichiometric alumina-magnesium spinel powder from an ammonium-alum based composition comprising the following steps:

(a) mixing an ammonium alum, a magnesium salt and a swelling agent, and heating said mixture above its fusion temperature, thereby obtaining a dehydrated alum composition having a bulk density less than 0.2 kg/dm^3;

(b) calcining the dehydrated at a first temperature stage of from about 750° to 850° C. and a second temperature stage of from about 900° to 1050° C.; and then

(c) recovering said spinel powder having a homogeneous unimodal pore structure with maximum pore radii between 4 and 5 mm and a specific area greater than 145 m^2/g.

4,532,122
ANTI-TRYPANOSOMAL ACTIVITY OF PLATINUM CO-ORDINATION COMPOUNDS

Michael S. Wysor, Hyattsville, and Leonard A. Zwelling, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

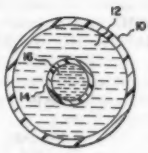
Filed Apr. 3, 1981, Ser. No. 250,991
Int. Cl.³ A61K *33/24*
U.S. Cl. 424—10 **4 Claims**

1. A method for treating an animal infected with African trypanosomiasis for seven consecutive days consisting of the steps of administering to said animal a therapeutically effective amount of chemical agents consisting of (a) intraperitoneal administration of 3 mg/kg bodyweight of an aqueous solution of cis-diamminedichloroplatinum (II) once a day; (b) subcutaneous administration of 3 ml of physiologic saline four times a day at six hour intervals to maintain hydration; and (c) oral administration of 250 mg/kg bodyweight of disulfiram or parenteral administration of 250 mg/kg bodyweight of diethyl dithiocarbamate four hours after step (a), once a day.

4,532,123
DUAL MICROCAPSULES AND PROCESS FOR THEIR PREPARATION

David L. Gardner, Bellville, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 402,164, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 354,869, Mar. 4, 1982, abandoned. This application Feb. 18, 1983, Ser. No. 466,500
Int. Cl.³ A61J *3/07*; A61K *9/52*; B01J *13/02*
U.S. Cl. 424—21 **22 Claims**



1. Dual Microcapsules having encapsulated therein at least two liquids and comprising:
(a) an outer polymeric membrane encapsulating a first liquid, and
(b) at least one Mini-Microcapsule suspended in said first liquid, said Mini-Microcapsule(s) having polymeric membrane(s) encapsulating a second liquid;
said Dual Microcapsules being further characterized in that;
(c) the second liquid contains therein a Conjugate formed between a Functional Agent and a Carrier,
(d) the first liquid contains therein a Deconjugating Agent,
(e) the polymeric membrane(s) of the mini-microcapsule(s) are at least semipermeable with respect to the Conjugate so that said Conjugate can diffuse therethrough and into said first liquid at a controlled preselected rate,
(f) the Conjugate and the Deconjugating Agent are interactive with each other to release or reform the Functional Agent from the Conjugate, and
(g) the outer polymeric membrane is at least semipermeable with respect to the Functional Agent so that said Functional Agent can diffuse therethrough at a controlled preselected rate.

15. A process for preparing Dual Microcapsules having encapsulated therein both a Conjugate formed between a Functional Agent and a Carrier and a Deconjugating Agent which comprises:
(a) agitating a solution of a polymer in an organic solvent therefor and adding thereto a mixture of;
(1) an aqueous liquid which is immiscible with said polymer solution and includes therein a Deconjugating Agent, and
(2) Mini-Microcapsules having a Conjugate encapsulated therein, so as to uniformly disperse said aqueous liquid and said Mini-Microcapsules throughout said polymer solution, and
(b) agitating the suspension of step (a) and adding thereto an organic liquid which is miscible with the polymer solvent and has little or no solvent power for said polymer in an amount sufficient to cause phase separation of the polymer and encapsulation of the aqueous liquid and the Mini-Microcapsule(s).

4,532,124
DENTAL RINSE

Euan I. F. Pearce, Wellington, New Zealand, assignor to Development Finance Corporation of New Zealand, Wellington, New Zealand

Filed Aug. 16, 1982, Ser. No. 408,410
Claims priority, application New Zealand, Aug. 19, 1981, 198099
Int. Cl.³ A61K *7/16, 7/18, 7/22*
U.S. Cl. 424—52 **6 Claims**

1. In the art or method of mineralizing dental plaque, the improvement consisting of the step of treating said plaque with a plaque mineralizing aqueous solution comprising 0.01 to 50% W/V of urea, a physiologically acceptable water-soluble fluoride salt, a physiologically acceptable water-soluble calcium salt and a physiologically acceptable water-soluble phosphate salt, the pH of the solution being from 1 to 9; said salts being present in concentrations such that the pH and fluoride, calcium and phosphate ion concentrations are such that the solution remains stable with respect to a calcium phosphate salt until said urea is metabolized by bacteria in plaque.

4,532,125
NEW SURFACE-ACTIVE STATISTICAL OLIGOMERS, A PROCESS FOR THEIR PREPARATION AND COMPOSITIONS IN WHICH THEY ARE PRESENT

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

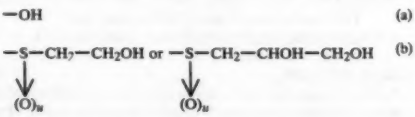
Filed Jul. 9, 1979, Ser. No. 56,110
Claims priority, application France, Jul. 13, 1978, 78 21082
Int. Cl.³ A61K *7/42, 9/12, 47/00*
U.S. Cl. 424—47 **21 Claims**

1. A surface-active statistical oligomer of the average formula

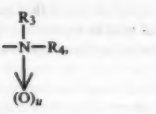
$$R_1O\text{+}[C_2H_3(CH_2\text{—}X\text{—}R_2)O]_m[C_2H_3(CH_2\text{—}Y)O]_n\text{+}H \quad (I)$$

in which R_1 denotes an unsubstituted or substituted, aliphatic or cycloaliphatic radical having from 4 to 30 carbon atoms, R_2 denotes a linear or branched alkyl radical having from 5 to 20 carbon atoms, m and n, which are identical or different, denote a number from 1 to 25, X denotes CH_2, O or

in which u denotes 0 or 1, and Y denotes one of the groups:

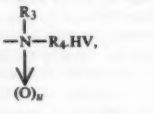


in which u denotes 0 or 1,



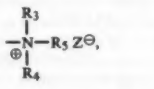
(c)

in which u denotes 0 or 1 and R_3 and R_4 which are identical or different, denote an alkyl or hydroxyalkyl radical containing from 1 to 3 carbon atoms, or R_3 and R_4 form, together with the nitrogen atom to which they are attached, a heterocyclic ring having 5 or 6 ring members



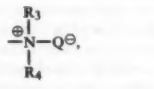
(d)

in which HV denotes an inorganic or organic acid and u, R_3 and R_4 are as defined in (c),



(e)

in which R_5 denotes a methyl, ethyl or hydroxyethyl radical, Z denotes an anion, and R_3 and R_4 are as defined in (c),

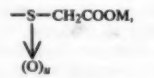


(f)

in which $Q^{\ominus}$ denotes an anion and R_3 and R_4 are as defined in (c),

(g) $-OSO_3M$, in which M denotes a hydrogen atom or an alkali metal or alkaline earth metal,

(h) $-OCOCH_2SO_3M$, in which M denotes a hydrogen atom or an alkali metal or alkaline earth metal, or



in which u denotes 0 or 1 and M denotes a hydrogen atom or an alkali metal or alkaline earth metal.

4,532,126

MASTICATORY SOFT ELASTIC GELATIN CAPSULES AND METHOD FOR THE MANUFACTURE THEREOF

William R. Ebert; Foo S. Hom, and Warren W. Kindt, all of Clearwater, Fla., assignors to R. P. Scherer Corporation, Troy, Mich.

Division of Ser. No. 376,115, May 7, 1982, Pat. No. 4,428,927.
This application Nov. 8, 1983, Ser. No. 549,998
Int. Cl.³ A23G *3/30*; A61K *9/68, 9/48*
U.S. Cl. 424—48 **9 Claims**

1. A method for preparing a chewable, non-toxic, filled, soft elastic gelatin capsule having selected chewable texture following chewing thereof, said method comprising the steps of preparing a soluble molten component of gelatin, water and a plasticizer selected from the group consisting of glycerin and sorbitol, preparing an insoluble molten masticatory substance, dispersing said insoluble substance in said soluble molten component for forming a gelatin shell formulation for said gelatin capsule, preparing a fill material, forming a shell from said gelatin shell formulation around said fill material to form said capsule, drying said shell, said selected chewable texture being attained when an insoluble chewable residue is formed from said insolublé substance upon chewing of said capsule, said residue substantially retaining its size and chewing consistency during chewing, the relative proportions of said soluble compoent and said insoluble masticatory substance being such that the size and chewing characteristics of said chewable residue are attained.

4,532,127

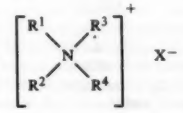
COMPOSITION FOR LIGHTENING OR COLORING HAIR CONTAINING AN OXIDIZING AGENT AND CERTAIN QUATERNARY AMINES

Raymond Feinland, Stamford, Conn.; Stanley Pohl, New Rochelle, and Michael Hnatchenko, Bronx, both of N.Y., assignors to Clairol Incorporated, New York, N.Y.

Division of Ser. No. 656,503, Feb. 9, 1976, Pat. No. 4,096,243.
This application Mar. 13, 1978, Ser. No. 886,190
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.³ A61K *7/135, 7/06*
U.S. Cl. 424—62 **20 Claims**

1. A two part composition comprising an aqueous base formulation component containing an alkalizing agent and a quaternary amine as a first part and an oxidizing solution component as a second part, said first and second part to be mixed just before use and cooperating to give a composition that simultaneously lightens and conditions hair and contains:

(a) from about 0.05 to 5% by weight of a quaternary amine in active form of formula:



(I)

in which:

R^1 and R^2 are long chain aliphatic hydrocarbon radicals having about 10 to 26 carbons;

R^3 and R^4 are lower alkyl radicals having about 1 to 5 carbons; and

X is an anion;

(b) sufficient oxidizing agent to lighten hair;

(c) sufficient alkalizing agent to give said composition a pH in the range of from about 8 to 11; and

(d) said composition containing no additives having large anionic groups that tend to deactivate said quaternary amine compound.

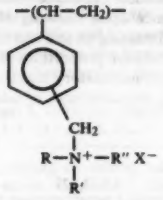
4,532,128

QUATERNARY AMMONIUM GROUP-CONTAINING POLYMERS HAVING ANTIMICROBIAL ACTIVITY

Bernard G. Sheldon, Palo Alto; Robert E. Wingard, Jr., Mountain View; Ned M. Weinshenker, Palo Alto, and Daniel J. Dawson, Los Altos, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 393,425, Jun. 29, 1982, abandoned, which is a division of Ser. No. 302,684, Sep. 15, 1981, abandoned.
This application Sep. 17, 1984, Ser. No. 651,654
Int. Cl.³ A01N *33/12*
U.S. Cl. 424—78 **4 Claims**

1. A method of inhibiting bacterial growth comprising applying to said bacteria an effective bacteria growth inhibiting amount of an antibacterial composition comprising an effective antibacterial concentration of a polymeric quaternary ammonium compound having at least about 10 recurring structural units of the formula:



wherein R is a 4 to 12 atom alkyl, X^- is a physiologically acceptable halide anion and R' and R'' are independently selected from the group of alkyls of from 1 to 4 carbon atoms, in a hygienically acceptable carrier.

4,532,129
COMPOSITION CONTAINING AND METHOD OF USING A FIBRINOLYTIC ACTIVE PRINCIPLE

Gaetano Comi, and Maurizio Pandolfi, both of Florence, Italy, assignors to Societa Italo-Britannica L. Mannetti-H. Roberts & C., Italy

Division of Ser. No. 366,276, Apr. 7, 1982, Pat. No. 4,471,053. This application May 1, 1984, Ser. No. 605,873
Claims priority, application Italy, Apr. 23, 1981, 48332 A/81
Int. Cl.³ A61K *37/48*
U.S. Cl. 424—94 **8 Claims**

1. A pharmaceutical composition for the prophylaxis and treatment of abnormal fibrin formation and thrombus formation comprising a pharmaceutical carrier and an effective amount of an active principle known as angiokinase enzyme isolated by extraction of vascular and richly vascularized connective tissues from mammals, through enzymatic lysis, with a protein N level of 0.2 μg/ml as measured with Lowry's method, as well as a mean molecular weight of approximately 18000 dalton; said principle having a fibrinolytic effect on fibrin both in the presence and absence of plasminogen, where said fibrinolytic activity is such that 30 μliters of angiokinase extract form a circular lysis area 3.908 mm in diameter on plates of human fibrin 2.503 mm thick, after 16 hours incubation at 37° C.

2. Pharmaceutical composition for the prophylaxis and treatment of abnormal fibrin formation and thrombus formation in human subjects, athero-arteriosclerosis at various levels, myocardial infarction, cerebral infarction, diabetic vasculopathies, arteriosclerotic and diabetic retinopathy, thrombosis of the retinal vessels, venal thrombosis, thrombophlebitis, postoperatory thrombosis, thromboembolism disease, pulmonary embolism, comprising a therapeutically effective quantity of the fibrinolytic active principle angiokinase as claimed in claim 1 for oral or parenteral administration, in a dose ranging from 10000 to 2000000 AU, as well as pharmaceutically compatible excipients.

4,532,130
PREPARATION OF SYNTHETIC FRYTHROCYTES

Ljubomir Djordjevich, Chicago; Anthony D. Ivankovich, Glenview, and William Gottschalk, Winnetka, all of Ill., assignors to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Continuation-in-part of Ser. No. 420,102, Sep. 20, 1982, abandoned, which is a continuation of Ser. No. 280,441, Jul. 6, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,409
Int. Cl.³ A61K *35/14, 35/18*
U.S. Cl. 424—101 **11 Claims**

1. A process for producing a sterile synthetic erythrocyte preparation providing a total hemoglobin concentration of at least 12 gram percent when suspended in a liquid medium to a hematocrit of 50 percent, the process comprising

Preparing a water-immiscible composition comprising between about 60 and about 90 weight percent lipids, between about 10 and about 40 weight percent of a sterol and between 0 and about 10 weight percent of an agent that imparts a negative charge to the surface of said composition,

separating from whole blood a stroma-free hemoglobin fraction,

adjusting the concentration of said stroma-free hemoglobin fraction to between about 30 and about 45 gram percent,

mixing said adjusted hemoglobin fraction with said water-immiscible composition at a hemoglobin fraction to lipid composition volume ratio of between about 3:1 and about 10:1,

agitating said mixture to disperse globules of said water-immiscible composition within said hemoglobin fraction,

pressurizing said dispersion to a gauge pressure of between about 400 kg/cm² and about 900 kg/cm²,

passing said pressurized dispersion through an orifice having a cross-sectional area of between about 0.1 mm and about 10.0 mm to substantially instantaneously release the pressure and thereby to form a preparation of synthetic erythrocytes having hemoglobin fraction encapsulated within membranes of said composition, the gauge pressure being selected according to the orifice size so as to obtain synthetic erythrocytes primarily in the 0.05 micron to 0.02 micron size range,

filtering said composition through a filter which passes particles having a diameter about 0.22 micron in diameter or less, thereby removing microorganisms from the preparation.

11. A process for producing a dried reconstitutable synthetic erythrocytes comprising separating from whole blood a stroma-free hemoglobin fraction, mixing said stroma-free hemoglobin fraction with a lipid composition in a vessel, pressurizing the resulting mixture, substantially instantaneously releasing said pressure to form a suspension of synthetic erythrocytes in a portion of said hemoglobin fraction, said synthetic erythrocytes having hemoglobin fraction encapsulated in lipid membranes, separating said synthetic erythrocytes from said aqueous medium, and reducing the water content of said synthetic erythrocytes to less than 10% by weight of said encapsulated hemoglobin fraction.

4,532,131
THERAPEUTIC COMPOSITIONS

Antonio J. Arias-Alvarez, Carpatos, Mexico, assignor to T and R Chemicals, Inc., Clint, Tex.

Division of Ser. No. 608,122, May 8, 1984, which is a continuation-in-part of Ser. No. 498,488, May 28, 1983, Pat. No. 4,464,357, and Ser. No. 498,489, May 26, 1983, Pat. No. 4,462,988. This application Jul. 12, 1984, Ser. No. 630,202
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ A61K *33/04*
U.S. Cl. 424—162 **7 Claims**

1. A method of treating epilepsy and epileptic conditions in a person suffering from the symptoms of epilepsy comprising orally administering to said person a symptom-alleviating amount of a compound which in aqueous solution furnishes sulfite ions, bisulfite ions or both sulfite and bisulfite ions.

4,532,132
SKIN CARE FORMULATIONS COMPRISING A WATER-IN-MINERAL OIL EMULSION AND SILOXANE COMPOSITIONS THEREFOR

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 11, 1983, Ser. No. 484,002
Int. Cl.³ C07F *7/08, 7/18*
U.S. Cl. 514—772 **23 Claims**

1. An organopolysiloxane having the formula

$$Z(CH_3)_2SiO\{(CH_3)_2SiO\}_x\{(CH_3)(R)Si-O\}_y\{(CH_3)(QR')SiO\}_zSi(CH_3)_2Z$$

wherein QR' denotes a polyoxyalkylene radical consisting of

a Q portion having the formula $-(OCH_2CH_2)_p(OCHCH_3CH_2)_qOR''$ and an R′ portion linking the Q portion to a silicon atom,

R denotes an alkyl radical having from 6 to 16 carbon atoms,

R′ denotes an alkylene linking radical,

R″ denotes a hydrogen atom or a lower alkyl radical,

Z denotes a monovalent radical selected from the group consisting of hydrocarbon radicals having from 1 to 5 carbon atoms, QR′ radicals and R radicals, there being an average of at least one QR′—radical and an average of at least one R radical per molecule of organopolysiloxane and the average values of x, y, z, p and q being such that $p \geqq q$, p+q has a value sufficient to provide a radical weight for Q of from 600 to 3500, $x \leqq 3y$, x+y+z has a value of from 30 to 400 and the total weight of Q radicals in the organopolysiloxane does not exceed a value of about ½ of the total weight of the organopolysiloxane.

4,532,133

LOW TEMPERATURE STABLE, EMULSIFIABLE VITAMIN A CONCENTRATES

Douglass N. Schmidt, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 24, 1983, Ser. No. 497,673

Int. Cl.³ A61K *31/00, 47/00, 31/07*

U.S. Cl. 514—725 **3 Claims**

1. A stabilized, emulsifiable, non-aqueous Vitamin A active liquid concentrate comprising:

(a) from about 20 percent by weight to about 40 percent by weight of Vitamin A palmitate as the sole or major source of Vitamin A,

(b) from about 25 percent by weight to about 60 percent by weight of an animal feed or food grade acceptable emulsifier system,

(c) from about 5 percent by weight to about 15 percent by weight of a crystallization inhibitor comprising a monoterpene, and

(d) a lower alkyl alcohol in an amount of 0 percent by weight to about 15 percent by weight,

said weight being based upon the total weight of the concentrate.

4,532,134

METHOD OF ACHIEVING HEMOSTASIS, INHIBITING FIBROPLASIA, AND PROMOTING TISSUE REGENERATION IN A TISSUE WOUND

William G. Malette, 667 Parkwood La., Omaha, Nebr. 68132, and Herbert J. Quigley, 9511 Mockingbird Dr., Omaha, Nebr. 68127

Continuation-in-part of Ser. No. 251,321, Apr. 6, 1981, Pat. No. 4,394,373. This application Nov. 8, 1982, Ser. No. 440,039

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.³ A61K *31/70;* **A61B** *17/04*

U.S. Cl. 514—55 **16 Claims**

1. The method of inhibiting fibroplasia and promoting tissue regeneration in vascular grafts which comprises placing, an effective amount of chitosan in contact with the graft, said chitosan being between 42 to 100 percent deacetylated; said chitosan having a molecular weight range of 10,000 to 2,055,00; said chitosan being soluble in distilled water and an acid selected from the group of hydrochloric, sulphuric, phosphoric and organic acid having an acid concentration of 0.02 to 1.0N; said chitosan solution having a pH of 1 to 8.

3. The method of inhibiting fibroplasia and promoting tissue regeneration in a wound which comprises placing in contact with said wound an effective amount of chitosan, said chitosan being between 42 to 100 percent deacetylated; said chitosan having a molecular weight range of 10,000 to 2,055,00; said chitosan being soluble in distilled water and an acid selected from the group of hydrochloric, sulphuric, phosphoric and organic acid having an acid concentration of 0.02 to 1.0N; said chitosan solution having a pH of 1 to 8.

16. The method of achieving hemostasis, inhibiting fibroplasia and for promoting tissue regeneration in a wound which comprises placing an effective amount of polyglucosamine in contact with the wound.

4,532,135

RENOPROTECTIVE TREATMENTS EMPLOYING VASODILATOR COMPOUNDS

K. David G. Edwards, New York, N.Y.

Continuation-in-part of Ser. No. 232,650, Feb. 19, 1981, Pat. No. 4,361,564, which is a continuation-in-part of Ser. No. 965,059, Nov. 30, 1978, Pat. No. 4,250,191. This application Sep. 27, 1982, Ser. No. 424,076

Int. Cl.³ A61K *31/54, 31/135, 31/415, 31/445, 31/475, 31/495, 31/505*

U.S. Cl. 514—222 **8 Claims**

1. A method of treating renal damage or failure in a host in need of treatment comprising administering to said host an effective amount for treating renal failure or damage, a vasodilator having postsynaptic alpha-adrenoceptor blocking activity and having antihyperlipidemic characteristics which lower the lipid levels in the bloodstream of the host, said vasodilator being selected from a group consisting of endralazine, trimazosin, minoxidil, diazoxide, doxazosin, triodazosin, phentolamine hydrochloride, phenoxybenzamine hydrochloride, benextramine, indoramine, and yohimbine.

4,532,136

4,4,4-TRICHLORO-1-PYRIDYL-BUT-2-ENE-1-ONES AND FUNGICIDES MADE THEREWITH

Wihelm Sittenthaler, Munich, Fed. Rep. of Germany, Peter Stanetty, Harmannsdorf, and Fritz Sauter, Vienna, both of Austria, assignors to Consortium Für Elektrochemische Industriegesellschaft GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,225

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304572; European Pat. Off., Oct. 24, 1983, 83110602.6

Int. Cl.³ C07D *213/50;* **A01N** *43/40*

U.S. Cl. 514—277 **2 Claims**

1. 4,4,4-trichloro-(x-pyridyl)-but-2-ene-1-one, wherein x is 2, 3 or 4.

2. A fungicidal composition comprising 0.01–95% by weight of 4,4,4-trichloro-(x-pyridyl)-but-2-ene-1-one, wherein x is 2, 3 or 4, as the active agent, and a carrier selected from the group consisting of a liquid, a solid and mixtures thereof.

4,532,137

2-THIAZOLAMINE DERIVATIVES, PROCESS FOR PREPARING SAME, AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAME

Isao Sakano; Tatsuro Yokoyama; Seitaro Kajiya, all of Yokohama; Yutaka Okazaki, Mobara; Hiroshi Tokuda, Mobara; Hiroshi Kawazura, Mobara; Mikio Kumakura, Mobara; Takuo Nakano, Yokohama, and Akira Awaya, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

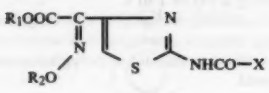
Division of Ser. No. 438,851, Oct. 22, 1982, Pat. No. 4,473,577. This application Jan. 6, 1984, Ser. No. 568,826

Claims priority, application Japan, Mar. 16, 1981, 56-36521

Int. Cl.³ C07D *277/48;* **A61K** *31/425*

U.S. Cl. 514—371 **6 Claims**

1. Method for treating a patient suffering from an immunodisease which comprises administering to said patient an effective immunodulating amount of 2-thiazolamine derivative of the formula:



(1)

wherein R_1 and R_2 independently are each a lower alkyl radical having 1 to 4 carbon atoms and X is a lower alkyl radical, a lower alkoxy radical or a haloalkoxy radical, and a member of the group consisting of (i) a pharmaceutically acceptable diluent, (ii) a pharmaceutically acceptable carrier and (iii) a combination of (i) and (ii).

4,532,138

THIAZOLIDIN-2-ONE ANALOGS

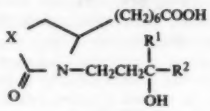
Joseph M. Muchowski, Sunnyvale, Calif., and Angel Guzman, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 323,152, Nov. 20, 1981, Pat. No. 4,410,526. This application Nov. 2, 1983, Ser. No. 528,494

Int. Cl.³ C07D *277/10;* **A61K** *31/425*

U.S. Cl. 514—369 **6 Claims**

1. A compound of the formula



I

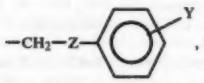
TEXT and the pharmaceutically acceptable, non-toxic salts and esters (alkyl, 1–6C) thereof, wherein:

X is S;

R^1 is selected from the group consisting of:

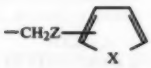
(a) alkyl or cycloalkyl of 3–8 carbons,

(b)



in which Z is O, S or $—CH_2$, and Y is lower alkyl (1–4C), lower alkoxy (1–4C), halo, or $—CF_3$, and

(c)



in which Z and X are as herein defined; and

R^2 is hydrogen or methyl.

4,532,139

COMPOUNDS AND COMPOSITIONS USEFUL FOR PRODUCING ANALGESIA

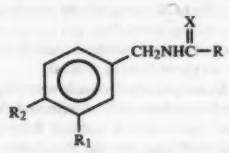
John M. Janusz, Fairfield, and Thomas R. LaHann, Cleves, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 14, 1983, Ser. No. 514,204

Int. Cl.³ A01N *37/22;* **C07C** *103/133*

U.S. Cl. 514—627 **19 Claims**

1. Alkynamide compounds and pharmaceutically-acceptable salts thereof, of the formula: •



wherein X is O or S; R is straight or branched alkyne having from 11 to 23 carbon atoms; R_1 is H, OH or OCH_3; R_2 is OH or a short-chain ester; and wherein at least one of R_1 and R_2 is OH or OCH_3.

4,532,140

METHOD OF MANUFACTURING AND PROCESSING ALCOHOLIC BEVERAGES, AND ALCOHOLIC LIQUIDS OBTAINED BY PERFORMING THE METHOD

Jean-Pierre Bonnome, Fontenay sous Bois, France, assignor to Union de Brasseries, France

Filed Mar. 21, 1983, Ser. No. 476,934

Claims priority, application France, Mar. 24, 1983, 82 05038

Int. Cl.³ C12C *11/04;* **C12G** *3/10;* **C12H** *1/04*

U.S. Cl. 426—13 **10 Claims**

1. A method of processing an alcoholic starting liquid which has been obtained by fermenting a must or a wort, wherein said alcoholic starting liquid is subjected to a first processing step consisting in ultrafiltration or reverse osmosis giving a concentrate and a permeate, the improvement wherein said permeate is further subjected to a second processing step consisting in reverse osmosis using a membrane which is substantially impermeable to alcohol, the concentrate from said second processing step added to the concentrate obtained from said first processing step to provide a liquid having a higher degree of alcohol than the starting liquid and wherein the said obtained liquid with the higher degree of alcohol is further subjected to another cycle of said first and second processing steps, the concentrate from said second processing step added to the concentrate from said first processing step to yield a liquid with a further increased alcohol content.

4,532,141

METHOD FOR PREPARING A SMOKE COLORED FOOD PRODUCT

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 417,171, Sep. 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 312,364, Oct. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 62,358, Jul. 31, 1979, abandoned. This application Oct. 30, 1983, Ser. No. 556,445

Int. Cl.³ A22C *13/00;* **A23L** *1/275*

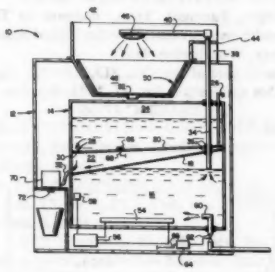
U.S. Cl. 426—250 **8 Claims**

1. A method for preparing a smoke colored food product comprising the steps of providing a tubular food casing having a tar-depleted liquid smoke coating which is derived from tar-containing liquid smoke and which is applied on said casing surface in sufficient quantity to provide said casing with an absorptive index of at least about 0.2 at 340 nm. wave length, said tar-depleted liquid smoke coating also providing said casing with a liquid smoke extract having an absorbance at 210 nm. wave length which is no more than about 60% of the absorbance for a similar extract from an identical casing having a comparable coating of said tar-containing liquid smoke sufficient to provide substantially the same absorptive index as said tar-depleted liquid smoke treated tubular food casing; stuffing the liquid smoke treated casing with foodstuff; and processing the encased foodstuff within the liquid smoke treated casing under conditions sufficient to convert said foodstuff into an edible food product and form smoke color on the resulting food product surface.

4,532,142
AUTOMATIC COFFEE MAKER

Lanty W. Dean, 3023 Lincoln Ct., Garland, Tex. 75041

Continuation-in-part of Ser. No. 297,953, Aug. 31, 1981, abandoned. This application Nov. 15, 1983, Ser. No. 551,867
Int. Cl.³ A47J 31/00
U.S. Cl. 426—388 13 Claims



11. An improved method for dispensing coffee, comprising:
heating water to an elevated temperature;
brewing coffee with the water from said heating step;
storing coffee at a temperature below serving temperature;
raising the temperature of a relatively small amount of coffee to serving temperature;
dispensing a portion of the coffee which has a raised temperature;
dispensing a portion of the coffee which is stored below serving temperature; and
mixing both dispensed portions in a predetermined ratio prior to delivery of the coffee.

4,532,143
SPREADABLE HONEY

Charles Brain, Wooster, and Barry Johnston, Copley, both of Ohio, assignors to The J. M. Smucker Company, Orrville, Ohio

Filed Jun. 15, 1984, Ser. No. 621,176
Int. Cl.³ A23L 1/06, 1/08, 1/04
U.S. Cl. 426—577 20 Claims

1. In a spreadable honey composition comprising honey and pectin, the improvement which comprises a mixture consisting of low-methoxyl pectin and high-methoxyl pectin in a ratio in the range of from about 1 part to about 5 parts low-methoxyl pectin per part of high-methoxyl pectin.

4,532,144
PROCESS FOR MANUFACTURE OF MEAT MEAL AND FAT FROM AN ANIMAL RAW MATERIAL

Borje Vernet, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

PCT No. PCT/SE82/00287, § 371 Date May 26, 1983, § 102(e) Date May 26, 1983, PCT Pub. No. WO83/01275, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 20, 1982, Ser. No. 503,145
Claims priority, application Sweden, Oct. 12, 1981, 8106018
Int. Cl.³ A23K 1/10
U.S. Cl. 426—643 7 Claims

1. In a process for continuous manufacture of meat meal and fat from an animal raw material by at least partly boiling a stream of said raw material in a boiler heated indirectly with steam, separating the boiled material into a stream of solid material, a stream of fat, and a stream of proteinuous stick water, at least partly drying said solid material in a dryer heated indirectly by steam, at least partly evaporating said stick water to a relatively concentrated state, and discharging the concentrated stick water and dried solid material from the process, the improvement which comprises generating a steam stream in a steam generator, causing the steam stream to drive a steam turbine under expansion to a relatively high back pressure, passing the steam stream at said back pressure to said boiler and said dryer to heat the same, driving a mechanical compressor from said turbine, at least partly effecting said evaporating of the stick water by causing said stick water stream to yield a stream of expansion steam through pressure reduction in an expansion vessel, passing said stream of expansion steam from said vessel to said compressor to compress the expansion steam, circulating a stream of concentrated stick water in a circulation circuit including said expansion vessel and a heat exchanger, flowing compressed steam from said compressor to said heat exchanger to yield heat to said stream of concentrated stick water, and discharging part of the concentrated stick water from said circulation circuit.

4,532,145
FIXING VOLATILES IN AN AMORPHOUS SUBSTRATE AND PRODUCTS THEREFROM

Fouad Z. Saleeb, Pleasantville, and John G. Pickup, Peekskill, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,666
Int. Cl.³ A23L 1/221, 1/226
U.S. Cl. 426—650 6 Claims

3. A spray-dried, moisture-stable fixed acetaldehyde composition comprising:
(a) an amorphous substrate consisting of from 10% to 30% of a water-soluble, crystalline, low molecular weight material which has molecular weight of from 90 to 500 and a melting point of from 80° to 180° C. and no less than 70% by weight of a water-soluble malto-dextrin having a D.E. of from 4 to 20 and an average molecular weight of from 1,000 to 6,000; and
(b) acetaldehyde fixed within the amorphous substrate.

4,532,146
MILKY PRODUCTS FOR MANUFACTURING CHOCOLATE-TRADE PRODUCTS AND METHOD OR PREPARATION THEREOF

Daniel Durand, and Yves Grandadam, both of Vendome, France, assignors to Fromageries Bel, France

Continuation of Ser. No. 413,558, Aug. 31, 1982, abandoned, which is a continuation of Ser. No. 185,496, Sep. 9, 1980, abandoned. This application May 7, 1984, Ser. No. 607,712
Claims priority, application France, Sep. 19, 1979, 79 23356
Int. Cl.³ A23C 9/00; A23G 3/00
U.S. Cl. 426—580 6 Claims

1. A method for the preparation of products consisting essentially of cocoa- and chocolate-milk and milk powder for use in replacing dried milk in the manufacture of chocolate trade products, the process consisting essentially of the following sequential steps:
(a) obtaining a raw material selected from the group consisting of lactoserum, serum proteins, caseins, caseinates, buttermilk and lactose;
(b) introducing said raw material as a powder or as a paste into a baking-extruding device with 0–20% weight of water;
(c) subjecting said raw material to working within said baking-extruding device by the application of a temperature within the device of 40°–90° C. and a pressure in the range of about 20–100 bars for a time ranging from 30 seconds to 2 minutes; and
(d) recovering the semi-pastey or semi-dry resulting product.

4,532,147

CACAO PRODUCT AND PROCESS THEREFOR

Rodger H. Jonas, Dover; Joseph W. Beel, Camden, and William R. Lynch, Milford, all of Del., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,807
Int. Cl.³ A23L *1/28*
U.S. Cl. 426—655 6 Claims

1. A process for preparing a tasteless and odorless colorant extract comprising the steps of:

(a) removing from a cacao material any cocoa butter contained therein;

(b) combining the cacao material with an alkalizing agent;

(c) heating the alkalizing agent and cacao material combination to between ambient temperature and about 121° C. for between 5 minutes and 36 hours to effect a change in the cacao material's pigment color;

(d) adding an aqueous alcoholic medium consisting essentially of alcohol and water to the cacao material after the alkalizing treatment for a period of time sufficient to extract the alkalized cacao material's pigments; and

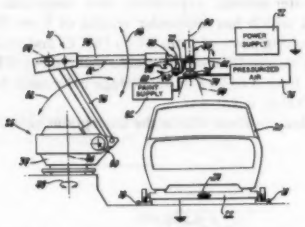
(e) separating the aqueous alcoholic medium containing said extracted cacao pigment from the cacao material.

4,532,148

ROBOT PAINTING SYSTEM FOR AUTOMOBILES

Anthony M. Vecellio, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1983, Ser. No. 481,119
Int. Cl.³ B05D *1/04*
U.S. Cl. 427—31 4 Claims



1. A method of painting a series of automobile bodies movable in an assembly line fashion along a guide track, said method utilizing a robot system which includes a paint module having at least two robots located therein and each of said robots being prepositioned relative to said guide track and having an arm provided with a support head movable about five control axes, a bell-type atomizing device attached to said support head and adapted to rotate about a spin axis, said method comprising:

a. conveying one of said automobile bodies along said guide track into said paint module;

b. locating said one of said automobile bodies in a predetermined stationary position on said guide track while in said paint module;

c. sealing said paint module so as to provide a sealed chamber for said one of said automobile bodies;

d. rotating the bell of said atomizing device about said spin axis at a speed in excess of 20,000 rpm to mechanically atomize a liquid paint supplied to the interior of said bell;

e. creating an electrostatic field between said rotating bell and said one of said automobile bodies for causing the atomized liquid paint to be directed from said rotating bell to said one of said automobile bodies in a cone-shaped pattern; and

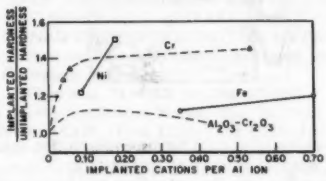
f. moving said rotating bell about said five control axes to different positions along a path that follows the surface contours of said one of said automobile bodies at a predetermined distance therefrom and at a speed which will prevent any gyroscopic effect developed by said rotating bell from distorting said cone-shaped pattern as said bell is moved about said five control axes while coating the surfaces of said prepositioned and stationary one of said automobile bodies with said atomized liquid paint.

4,532,149

METHOD FOR PRODUCING HARD-SURFACED TOOLS AND MACHINE COMPONENTS

Carl J. McHargue, Farragut, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 313,413, Oct. 21, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,049
Int. Cl.³ C23C *17/00*
U.S. Cl. 427—38 5 Claims



1. A method for increasing the hardness of a near-surface region of an article, comprising:

mounting in an ion-implantation system an article having a near-surface region of a refractory material selected from the group consisting of ceramic and diamond,

producing an increase in the hardness of said region by ion-implanting the same with metal ions to effect formation of a metastable alloy in which the implanted ions are distributed between substitutional and interstitial lattice sites, and

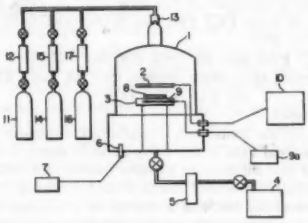
terminating said ion-implanting when the implanted-ion fluence reaches a value corresponding to a preselected increased hardness value.

4,532,150

METHOD FOR PROVIDING A COATING LAYER OF SILICON CARBIDE ON THE SURFACE OF A SUBSTRATE

Morinobu Endo, Nagano; Minoru Takamizawa, Tokyo; Tatsuhiko Hongu, Kanagawa, and Susumu Ueno, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,293
Claims priority, application Japan, Dec. 29, 1982, 57-228504
Int. Cl.³ C23C *13/04*
U.S. Cl. 427—39 9 Claims



1. A method for providing a coating layer of an amorphous silicon carbide of the composition expressed by the formula

Si_xC_{1-x}, in which x is a positive number in the range from 0.2 to 0.9, on to the surface of a substrate which comprises subjecting the surface of the substrate to an atmosphere of plasma generated in a gaseous atmosphere containing a vapor or gas of an organosilicon compound having no halogen or oxygen atom directly bonded to the silicon atom in the molecule.

4,532,151

METHOD FOR COATING A SURFACE WITH A LAYER

Stig Stenlund, Saltsjöbaden, Sweden, assignor to HEP Products AB, Älvsjö, Sweden

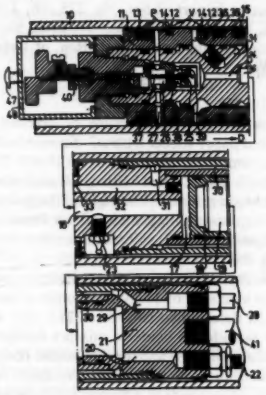
PCT No. PCT/SE83/00250, § 371 Date Feb. 15, 1984, § 102(e) Date Feb. 15, 1984, PCT Pub. No. WO84/00016, PCT Pub. Date Jan. 5, 1984

PCT Filed Jun. 17, 1983, Ser. No. 588,869

Claims priority, application Sweden, Jun. 18, 1982, 8203782

Int. Cl.³ B05D *3/06, 7/22;* **C23C** *13/08;* **B05C** *3/02*

U.S. Cl. 427—54.1 **12 Claims**



1. A method of coating a surface comprising the steps of establishing a first zone which is disposed in sealed relation to a portion of said surface and which is movable relative to said surface in a defined direction, establishing at least one further zone which is disposed in sealed relation to a further portion of said surface and which is movable relative to said surface in said defined direction together with said first zone, said further zone being located behind said first zone in said defined direction of movement, evacuating said first zone to clean the portion of said surface adjacent said first zone and to remove air and impurities from pores in the said portion of said surface, supplying under pressure to said further zone a liquid to be coated onto said surface, said evacuating and liquid supplying steps being effected while said first and further zones are being moved relative to said surface in said defined direction thereby to cause said liquid in said further zone to be coated onto a portion of said surface which had previously been cleaned in said first zone as said zones are moved relative to said surface, and spreading said liquid to a desired layer thickness during said relative movement between said zones and said surface.

8. The method of claim 1 wherein said liquid comprises a material which hardens when irradiated with ultraviolet rays, said method including the step of so irradiating the liquid which has been spread to a desired layer thickness during said relative movement between said zones and said surface.

4,532,152

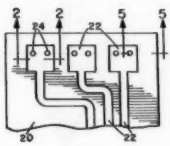
FABRICATION OF A PRINTED CIRCUIT BOARD WITH METAL-FILLED CHANNELS

Vito D. Elarde, 6429 Lance Ct., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 354,964, Mar. 5, 1982, abandoned, which is a continuation-in-part of Ser. No. 306,240, Sep. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 107,045, Dec. 26, 1979, abandoned. This application Jul. 11, 1983, Ser. No. 512,461

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—96 **15 Claims**



1. A process of fabricating a circuit board comprising the steps of:

injection molding a plastic substrate having a pattern of channels in at least one of its sides defining channel surfaces and non-channel surfaces, the pattern of channels representing a predetermined set of conductive paths extending along the one side of the substrate;

depositing at least one layer of metal onto the one side of the substrate over the channel surfaces and the non-channel surfaces thereof, the depositing being performed according to a method selected from the group consisting of flame spraying, a combination of electroless plating and electroplating, gas plating and vacuum deposition; and

removing the metal above the non-channel surfaces of the one side of the substrate to delineate a conductive pattern of metal-filled channels.

4,532,153

METHOD OF BONDING MAGNETIC PARTICLES TO A RESIN PARTICLE

Jitka Solc, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 345,305, Feb. 3, 1982, Pat. No. 4,438,179. This application Jul. 29, 1983, Ser. No. 518,572

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—131 **5 Claims**

1. A method comprising providing a synthetic resinous particle having a diameter of from about 1 to 150 microns, a water swellable bonding polymer coating grafted to the surface thereof, bonding a plurality of flocculated magnetic particles to the bonding polymer to thereby form a magnetic coating on the surface of the synthetic resinous particle.

4,532,154

PROCESS FOR MAKING A SIZED MULTIFILAMENT YARN OF AN AROMATIC POLYAMIDE

Evert Harteman, Arnhem, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Division of Ser. No. 323,566, Nov. 20, 1981, Pat. No. 4,455,341. This application Apr. 12, 1984, Ser. No. 599,676

Claims priority, application Netherlands, Nov. 24, 1980, 8006393

Int. Cl.³ B05D *3/12, 7/02*

U.S. Cl. 427—175 **6 Claims**

1. A process for the manufacture of a multifilament yarn provided with a water-soluble size selected from the group of film-forming materials consisting of polymers built up from acrylic acid or its derivatives and polyesters derived from at least a dicarboxylic acid, at least a diol and a sulphonated

dicarboxylic acid, the filaments of the sized yarn having a cohesion corresponding to a Manra number not higher than 40, said process being characterized in that a multifilament yarn of an aromatic polyamide having a tenacity of at least 15 cN/dtex, an initial modulus of at least 400 cn/dtex, and a moisture content which is lower than the equilibrium moisture content of the yarn, is subjected, while under a tension of at most 0.25 cN/dtex, to a continuous wetting treatment with an aqueous solution of a size as aforesaid, and the yarn is subsequently wound into a yarn package.

4,532,155

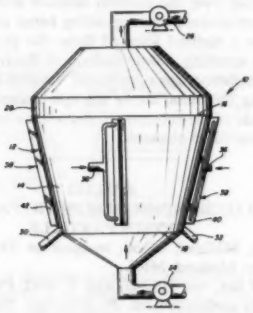
APPARATUS AND PROCESS FOR COATING, GRANULATING AND/OR DRYING PARTICLES

Victor Golant, Chicago; David Hsia, Libertyville, and William Taylor, Jr., Chicago, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 520,946, Aug. 8, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 679,796

Int. Cl.³ B05D *7/00, 1/02*

U.S. Cl. 427—213 **12 Claims**



8. A process for coating particles, comprising the steps of providing a stationary vertically extending round tower having a side wall extending between a top end and a bottom end,

introducing a first gas into the bottom end of the tower,

flowing said first gas generally vertically and upwardly through said tower,

introducing particles into said tower for coating, said particles being suspended in the flow of said first gas,

feeding a coating material containing a liquid into said tower for coating the particles,

introducing a second gas into said tower through said side wall from a plurality of locations with at least some of said locations spaced above said bottom end,

directing said second gas into said tower generally horizontally and circumferentially,

dispersing said coating material by means of said second gas,

rotating substantially all of said particles three-dimensionally and circulating substantially all of said particles by means of said second gas to evenly coat said particles with said coating material, and

evaporating some of the liquid from the coating material on substantially all of said particles by means of said second gas.

4,532,156

PROTECTION AGENT FOR FRUITS AND VEGETABLE TUBERS

Selwyn Everest-Todd, Everingham, England, assignor to Willow House Research Unit, York, England

Filed Sep. 26, 1983, Ser. No. 536,058

Claims priority, application United Kingdom, Sep. 24, 1982, 8227331

Int. Cl.³ B05D *7/00;* **A21D** *4/00;* **A23C** *3/00;* **A23L** *3/36*

U.S. Cl. 427—220 **3 Claims**

1. A method for forming a granule charged with a protection agent for fruits and vegetable tubers in store comprising the steps of forming the granules, applying a carboxylic acid to said granules while agitating said granules, and then applying an alkyl amine to the acid dosed granules while agitating said granules.

4,532,157

PROCESS FOR PRODUCING COLORED, RESIN-IMPREGNATED PAPER SHEETS WITH A THREE-DIMENSIONAL SURFACE STRUCTURE

Hans J. Schmidt, Haibach; Hans-Dieter Diesel, Mainhausen, and Burkhard Sauer, Sulzbach, all of Fed. Rep. of Germany, assignors to Letron GmbH, Aschaffenburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 275,260, Jun. 19, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,695

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024391

Int. Cl.³ B05D *3/02, 5/00*

U.S. Cl. 427—262 **6 Claims**

1. Process for the manufacture of colored, impregnated lacquer coated paper sheets with a 3-dimensional surface structure, which comprises:

(a) printing a paper sheet with a pattern using an aqueous protein based gravure printing ink, the printing ink including a lacquer-repelling material, in those regions where the lacquer coating is to be thinner than in other regions;

(b) drying the printed sheet;

(c) lacquering the printed sheet with an aqueous lacquer having a viscosity of 15 to 40 seconds in the AK-4 beaker at 20° C., determined to DIN 53211, and which aqueous lacquer includes as binder a mixture comprising

(A) a mixture of urea and/or melamine resin, dissolved in water, and an aqueous acid as hardener, which cures in less than 100 seconds at a temperature above 100° C. after the aqueous resin solution is mixed with the acid, and

(B) a binder selected from the group consisting of

(a) water-dilutable polyester resin,

(b) acrylate resin, and

(c) ethoxylated derivative of glycerin,

there being 10 to 250 parts by weight of solids of binder (B) for every 100 parts by weight of solids of binder (A),

said lacquer being repelled at places printed with printing ink containing lacquer-repelling material and the lacquer film being thinner in those places than in others; and

(d) curing the lacquered sheet without pressure by the action of air heated to above 100° C.

4,532,158

APPARATUS FOR AND A METHOD OF METERING OF COATING ON A MOVING WEB

John A. Taylor, Suffern, and Robert M. Fridhandler, Blauvelt, both of N.Y., assignors to St. Regis Paper Company, New York, N.Y.

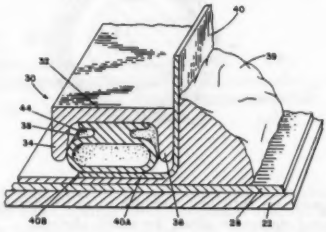
Filed Apr. 9, 1981, Ser. No. 252,302

Int. Cl.³ B05C *11/04*

U.S. Cl. 427—355 **4 Claims**

1. Apparatus for metering of coating on the coated side of a moving web of material comprising an expansible pressure tube extending across the full width of the coated side of the web, a backing surface adapted to support the other side of the

web, a skirt of papery, flexible plastic sheet material extending across the full width of the coated side of the web and having a free end portion extending contigous and parallel to and in the direction of movement of the web and intermediate the tube and web, and means for supporting the tube and skirt, the tube upon expansion having a part of its surface in contact with said portion of the skirt and cooperating with the web and said portion of the skirt and the backing surface to create a constant



pressure web coating region throughout the space between the web and said portion of the skirt within which the coating thickness is skimmed down to provide a layer of coating on the web of substantially uniform thickness, the free end portion of the skirt being positioned to prevent the surface of the tube from contacting the web and having its trailing edge, relative to the direction of movement of the web, in contact with the tube to prevent flapping of the edge.

4,532,159

FLASH-RUST PROTECTING OF FERROUS SUBSTRATE

David Caldwell, Sale, England; David Miller, Buckley, Wales, and John C. Padget, Frodsham, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 224,450, Jan. 12, 1981, abandoned. This application Mar. 11, 1981, Ser. No. 242,522

Claims priority, application United Kingdom, Feb. 1, 1980, 8003459

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—388.4 **8 Claims**

1. A method of protecting a ferrous substrate by application of a coating having low susceptibility to flash-rusting which comprises (a) applying to the said substrate by brushing, spraying or roller a coating of a water-based paint composition consisting essentially of (i) an aqueous latex of a film-forming polymer consisting essentially of units derived from one or more mono-ethylenically unsaturated monomers containing a single vinyl or vinylidene group and (ii) a corrosion-inhibiting pigment, the pH of the composition being in the range of from 4.0 to 6.5; and (b) allowing the applied coating to dry at ambient temperature and without any subsequent baking or curing at elevated temperature.

4,532,160

METHOD AND APPARATUS FOR COATING FILAMENTARY OBJECTS

Lubos J. B. Vácha, Tyresö, and Ulf H. Lindborg, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00410, § 371 Date Jul. 27, 1983, § 102(e) Date Jul. 27, 1983, PCT Pub. No. WO83/01946, PCT Pub. Date Jun. 9, 1983

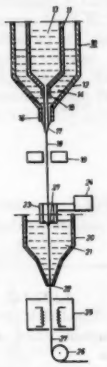
PCT Filed Dec. 1, 1982, Ser. No. 521,759

Claims priority, application Sweden, Dec. 3, 1981, 8107238

Int. Cl.³ B05C *3/05, 3/12*

U.S. Cl. 427—434.5 **7 Claims**

1. Apparatus for coating a filamentary object which is passed through a bath of liquid coating material and which has a point of entry into the bath at the surface thereof, said apparatus comprising means surrounding the filamentary object and immersed into the liquid coating material at the point of entry of the filamentary object into the bath of liquid coating material and vibrator means connected to the means surrounding the filamentary object to vibrate the latter means at the surface



of the bath into which the filamentary object is introduced whereby the coating of material on the filamentary object will be uniform for increased speeds of travel of the filamentary object.

4,532,161

PROCESS FOR THE AQUEOUS IMPREGNATION OF GREEN WOOD WITH OIL SOLUBLE METAL SALTS

Albert V. Collins, Fairview Park, and Richard W. Asmus, Lakewood, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation of Ser. No. 418,783, Sep. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 386,659, Jun. 9, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 598,774

Int. Cl.³ A01N *55/02;* **B05D** *1/18*

U.S. Cl. 427—440 **37 Claims**

21. A method of impregnating green wood with metal salts which comprises

(a) immersing the green wood in an aqueous system comprising

(i) at least 50% by weight of water,

(ii) at least one oil-soluble acid, neutral or basic metal salt of one or more organic carboxylic acids, wherein the metal salt is present in the aqueous mixture in an amount sufficient to provide a metal content of from about 0.2 to 10% by weight,

(iii) from about 0.25 to about 7.5% by weight of at least one anionic or nonionic surfactant, and

(iv) less than 20% by weight of a hydrocarbon solvent

for a period of time sufficient to enable the metal salt to penetrate into the wood,

(b) removing the wood from the aqueous system.

4,532,162

CAR RADIO AND STEREO PROTECTOR

Thomas B. Neece, 14 Wilder St., San Francisco, Calif. 94131

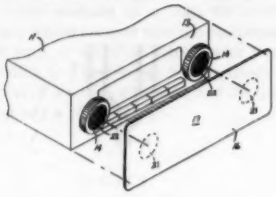
Filed Apr. 29, 1983, Ser. No. 489,854

Int. Cl.³ F41H *3/00*

U.S. Cl. 428—31 **9 Claims**

1. A protective device for preventing theft of a normally visible radio from the dash area of a vehicle, said radio having a front panel with control knobs projecting therefrom, comprising a generally planar protective panel having a front surface similar in appearance to the dash area around the radio, and means on the back side of the protective panel for removably securing the protective panel to the front portions of the

control knobs with the protective panel being positioned in front of the radio in closely spaced parallel relation to the front panel of the radio to at least partially conceal the radio from



view, with the surface of the protective panel blending visually with the surrounding area of the dash to conceal the presence of the radio.

4,532,163

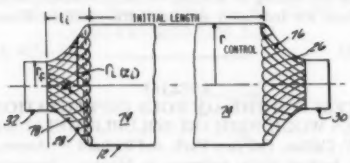
ELASTOMERIC MEMBER

Lyle O. Hoppie, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1983, Ser. No. 469,619

Int. Cl.[3] B32B *23/02*

U.S. Cl. 428—36 **9 Claims**



1. An article of manufacture comprising a generally cylindrical elastomeric member having a main body section of substantially constant diameter and a transition section at each end thereof, each of gradually reducing diameter to an end having a final diameter smaller than said diameter of said body section; and a substantially rigid end piece secured to each of said respective transition sections of said elastomeric member at the end thereof of substantially cylindrical configuration having a diameter matched to the final diameter of said transition sections; each segment of said transition sections having a profile and deflection characteristic under tension such that upon extension of the elastomeric member by a predetermined axial separation of the end pieces and stretching of the elastomeric member, a substantially constant diameter stretched elastomeric member results, of a final diameter corresponding to the diameter of said end pieces.

4,532,164

HEAT-SHRINKABLE ARTICLE

Carney P. Claunch, II, Redwood City; Thomas A. Kridl, and Jose P. Gamarra, both of Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 15, 1983, Ser. No. 532,329

Int. Cl.[3] H05B *3/58*

U.S. Cl. 428—36 **20 Claims**

1. A heat-shrinkable article, comprising:

(1) a heat-shrinkable layer of polymeric material;

(2) a laminar heater which comprises:

(a) two laminar apertured metal electrodes, one of the electrodes being on the inside of the article when it shrinks; and

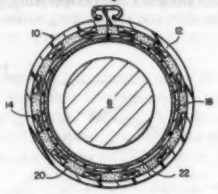
(b) a conductive polymer heating element between the electrodes; and

(3) a member for protecting a substrate from the laminar heater upon shrinking of the article against the substrate, which member,

(a) is secured to the inside of the heater prior to shrinking the layer of polymeric material,

(b) has a first shape before the article shrinks,

(c) is deformed to a second shape when the article shrinks, and



(d) possesses sufficient strength to resist piercing by the metal electrodes when the article shrinks,

whereby when the article is placed adjacent a substrate and the heater activated, the article shrinks against the substrate, and the member is deformed to its second shape for protecting the substrate from the heater.

4,532,165

POLY-1-BUTENE RESIN COMPOSITION

Takashi Hashimoto, Waki, and Chikara Igarashi, Ohtake, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

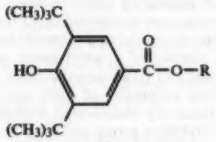
Filed May 9, 1983, Ser. No. 492,750

Int. Cl.[3] F16L *9/00*

U.S. Cl. 428—36 **15 Claims**

1. A cold or hot water supplying pipe capable of supplying cold or hot water containing sterilizing chlorine dissolved therein, said pipe being composed of a resin composition comprising a poly-1-butene polymer and at least one hindered phenol selected from the group consisting of

(a) 3,5-di-tert-butyl-4-hydroxybenzoates of the following formula



wherein R represents an alkyl group having 1 to 18 carbon atoms or an aryl group having 6 to 18 carbon atoms;

(b) 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl)benzene,

(c) 1,3,5-tris(4-tert-butyl-3-hydroxy-2,6-dimethylbenzyl-)isocyanurate,

(d) tris(3,5-di-tert-butyl-4-hydroxybenzyl)isocyanurate,

(e) n-octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate,

(f) a nickel salt of a monoethyl ester of bis(3,5-di-tert-butyl-4-hydroxybenzylphosphonic acid),

(g) 2,2'-dihydroxy-3,3'-di(α-methylcyclohexyl)-5,5'-dimethyl-diphenylmethane,

(h) 4,4'-thiobis(3-methyl-6-tert-butyl-phenol),

(i) 1,1,3-tris(2-methyl-4-hydroxy-5-tert-butyl-phenyl)butane,

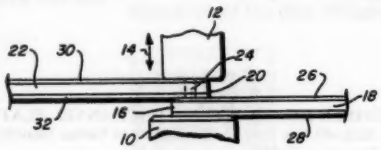
(j) tetrakis(methylene-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate)methane, and

(k) 4,4'-methylene-bis(2,6di-tert-butyl-phenol) Ain an amount effective to provide said polymer with resistance to chemical degradation from the effects of said sterilizing chlorine.

4,532,166
WELDING OF WEB MATERIALS

Karl V. Thomsen, Ontario, and Richard W. Radler, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1983, Ser. No. 538,409
Int. Cl.³ B32B 3/24
U.S. Cl. 428—57 6 Claims

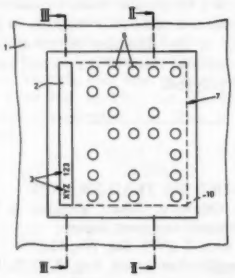


1. A welded, flexible, thermoplastic belt comprising a web having an outer coating of thermoplastic material along substantially the entire length of said web, said thermoplastic belt having a seam comprising a first edge of said web having a plurality of apertures overlapping an opposite edge of said web, said opposite edge comprising a portion of said outer coating of said thermoplastic material, to form a region of contiguous contact between said first edge and said portion of said outer coating of said thermoplastic material on said opposite edge, said thermoplastic material substantially filling said apertures thereby bonding said first edge to said opposite edge.

4,532,167
READABLE GOODS-MARKING SYSTEM FOR TEXTILE PROCESSING

Peter R. Mohr, Remseck, Fed. Rep. of Germany, assignor to Erhardt & Leimer GmbH, Augsburg, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,639
Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217600
Int. Cl.³ B32B 3/16
U.S. Cl. 428—78 7 Claims



1. In combination with a textile web in production, a marking system comprising:

a heat-, water-, and chemical-resistant substrate layer having a front and back face;

pigment forming indicia carried on the front face of said substrate layer; and

a heat-, water-, and chemical-resistant cover layer formed of a transparent and flexible synthetic resin,

and embedding the substrate layer and pigment over the front face and back face thereof,

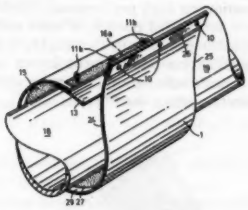
said cover layer being bonded to the web around the substrate layer, at the back face of the substrate layer, and at a field on the web immediately adjacent the substrate layer, and

stiffening the web at the substrate layer and at the field thereadjacent, the web and cover layer being formed in the field with a readable array of holes.

4,532,168
HEAT SHRINKABLE COVERING

Robert E. Steele, Mississauga; Dilip K. Tailor, Bramalea, and Rajni R. Lakhani, Rexdale, all of Canada, assignors to Shaw Industries Limited, Rexdale, Canada

Filed May 18, 1984, Ser. No. 611,872
Claims priority, application Canada, May 25, 1983, 428834
Int. Cl.³ F16L 21/06; B32B 3/04, 3/06, 3/08
U.S. Cl. 428—99 35 Claims



1. A heat shrinkable covering adapted to be wrapped around an article, comprising a flexible sheet that is heat shrinkable in a longitudinal direction and has two longitudinally spaced transversely extending parallel zones adapted to be brought into superimposed overlapping relationship when the sheet is applied to the article, a heat-resistant stiffening member offering differential rigidity connected along each zone and providing relatively more rigid resistance to longitudinal deformation of the zone in the plane of the sheet and providing relatively less resistance to deformation of the zone in directions perpendicular to the plane of the sheet, one of said stiffening members, of one zone adapted to form the overlap portion, being formed with a series of transversely spaced holes through it, and the other stiffening member, of the zone adapted to form the underlap portion, having connected to it a series of stud members securable through said holes, respectively, each stud member comprising arm portions which are malleable and can be spread apart and flattened onto the upper surface of the overlap portion to couple said one stiffening member and its overlap portion relative to the other stiffening member and its underlap portion, the coupled stiffening members resisting deformation forces tending to separate the overlapped zones longitudinally while permitting the zones to be deformed together inwardly toward a profile of the article underlying the zones when the sheet is wrapped around the article and is heat shrunk, and wherein the arm portions of each stud member form adjacent the upper end of the stud member a laterally resiliently compressible head portion of increased lateral dimension adapted to snap fit through the hole of said one stiffening member or through a hole in the sheet adjacent thereto.

4,532,169
HIGH PERFORMANCE FIBER R[illegible]ON PRODUCT, HIGH STRENGTH HYBRID C[illegible]SITES AND METHODS OF PRODUCING [illegible]ND USING SAME

Earl P. Carley, Upper Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 5, 1981, Ser. No. 308,216
Int. Cl.³ B32B 5/08, 5/10, 5/12; B65H 81/02; D04H 5/04
U.S. Cl. 428—109 52 Claims

1. A method of producing a tape of aligned continuous high performance reinforcing fiber, comprising:

preparing a fiberous mat having a thickness in the range of about 0.01 to about 0.05 inch impregnated with an effective amount of a matrix compatible polymer,

coating one or more continuous high performance reinforc-

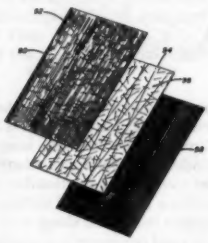
ing fibers over a substantial portion of their surface with a matrix compatible polymer to thoroughly wet the fibers,

contacting the one or more coated continuous reinforcing high performance fibers under tension in the form of one or more layers, wherein the fibers are in a unidirectional orientation in each layer, with the impregnated mat to form a tape, and

releasing the tension of the tape.

23. An improved high performance continuous reinforcing fiberous tape product, which maintains substantially the alignment of the high performance fiberous reinforcement in the tape during molding, comprising:

a layer of fiberous mat having a thickness in the range of about 0.01 to about 0.05 inch, a matrix compatible polymer impregnating the fiberous mat, and more than one length of continuous high performance reinforcing fibers coated over a substantial portion of their surfaces with a matrix compatible polymer to thoroughly wet the fibers, where the fibers form one or more layers in which the fibers have a unidirectional orientation in each layer and where the fibers contact the fiberous mat.



51. Method of producing a molded article with increased physical properties at desired locations in the article, comprising:

(a) placing in a compression mold a molding compound selected from sheet molding compound, high reinforcement content sheet molding compound, bulk molding compound, thick molding compound, filament wound molding compound or mixture thereof, or heated thermoplastic molding compounds,

(b) placing in the mold with the molding compound one or more segments of a tape of aligned high performance reinforcing fibers having attached to the fibers a fiberous mat which is impregnated with a matrix compatible polymer,

(c) arranging the segments of tape to be at the locations in the molding article, where the higher physical properties are desired, and

(d) activating the compression molding device to close to mold the article,

(e) activating the compression molding device to open, and

(f) recovering the molded article having high performance fiber reinforcement that is substantially aligned as the tape was placed in the mold at the desired location.

4,532,170

SCUFF-RESISTANT LAMINATES

Robin D. O'Dell, Pasadena; Israel S. Ungar, and Herbert I. Scher, both of Randallstown, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Division of Ser. No. 521,762, Aug. 9, 1983, Pat. No. 4,499,137. This application Jul. 25, 1984, Ser. No. 634,163

Int. Cl.[3] **B32B** *3/00; 7/14, 5/18, 9/26*

U.S. Cl. 428—143 **13 Claims**

1. A facing sheet for use in the manufacture of stain- and scuff-resistant decorative laminates, said facing sheet having thereon an ultra-thin facing layer comprising

(1) a solid, finely particulate lubricant in an amount sufficient such that, during use of the facing sheet to make decorative laminate, the particulate lubricant melts and blooms to the surface thereby providing a decorative laminate having simultaneously good clarity and improved scuff resistance, with the proviso that said solid lubricant is not an oxidized wax or a silicone resin, and

(2) sufficient binder material for said particles of lubricant to bind said particles to the surface of said facing sheet, said facing sheet being impregnated with a thermosetting resin compatible with said binder material.

4,532,171

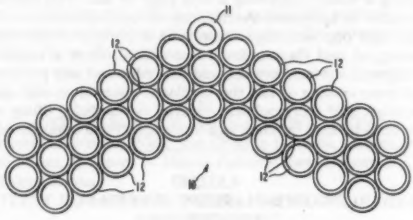
MULTIFIBER DESIGN FOR MICROCHANNEL PLATES

John T. Balkwill, San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 374,535, May 3, 1982, abandoned. This application Dec. 5, 1983, Ser. No. 557,814

Int. Cl.[3] **B32B** *3/20;* **B22B** *31/00;* **D02G** *3/00*

U.S. Cl. 428—188 **4 Claims**



1. A microchannel plate having a substantially flat front surface, said plate comprising a plurality of segments compactly packed together, each segment having a polygonal surface which forms a part of said front surface, each segment comprising a plurality of cylindrical hollow glass tubes of a first kind and of a second kind which have thicker channel walls than said tubes of the first kind, said tubes of first and second kinds being of a same outer diameter and said tubes of the first kind being packed compactly together in parallel in a parallel relationship in the direction perpendicular to said polygonal surface, and said tubes of the second kind being at each corner of said polygon.

4,532,172

LEADER OR TRAILER TAPE

Masaaki Fujiyama, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Aug. 2, 1979, Ser. No. 62,999

Claims priority, application Japan, Aug. 2, 1978, 53-93567

Int. Cl.[3] **B32B** *5/16;* **G11B** *5/78*

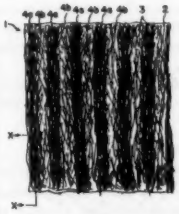
U.S. Cl. 428—212 **14 Claims**

1. A magnetic recording tape comprising a leader or trailer segment and a magnetic recording layer segment, the magnetic recording layer segment comprising a magnetic recording layer provided on a substrate and the leader or trailer segment comprising a support member having a coating layer provided on each of the surface and back sides of the support and not having a magnetic recording layer provided thereon; each coating layer comprising a binder and a powder, said powder being selected from the group consisting of extenders and white pigments, the surface roughness of the coating layer on the surface side of the support being finer than that of the coating layer on the back side of the support, the surface roughness of the former being 0.05 to 2 microns and the surface roughness of the latter being at least 0.5 micron.

4,532,173
FIBRE-IMPLANTED NONWOVEN FABRIC

Migaku Suzuki; Toshio Kobayashi; Satoshi Sasaki, and Shigeo Imai, all of Ehime, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Jan. 25, 1983, Ser. No. 460,908
Claims priority, application Japan, Jan. 31, 1982, 57-13531
Int. Cl.³ B32B 7/02
U.S. Cl. 428—218 7 Claims

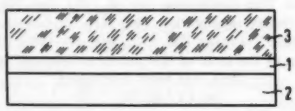


1. Fibre-implanted nonwoven fabric comprising a stretchably elastic foamed sheet of open pore type having a thickness less than 5 mm and short fibres of which the fibre length is shorter than 100 mm and the basic weight is between 5 and 80 g/m^2, wherein said short fibres are implanted from at least one surface of said foamed sheet deeply into the interior thereof in a striped pattern defined by alternately arranged zones of high density and low density and wherein said short fibres are not only mutually entangled on said surface but also are interlocked with material of said foamed sheet on said surface as well as in the interior of said foamed sheet.

4,532,174
LAYER SYSTEM FOR OPTO-ELECTRONIC DISPLAYS

Helmut Freller, Röthenbach; Heinrich Hässler, Wendelstein; Peter Schack, Nuremberg, and Ludwig Schultz, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,805
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1982, 3227898
Int. Cl.³ B32B 7/02, 15/04
U.S. Cl. 428—215 8 Claims



1. In a layer system for opto-electronic displays of the type having a first layer formed of a transparent, not solderable oxide semiconductor material the improvement comprising a second layer formed of a solderable oxidation-resistant material formed at least partially of a copper alloy having at least one alloying additive consisting of a metal which is less noble than copper and selected from the group of magnesium, aluminum, beryllium, gallium, germanium, silicon, tin, zinc, zirconium and chromium.

2. The layer system of claim 1 wherein the first layer has a thickness between 25 to 500 nm, and said second layer has a thickness of between 200 to 1200 nm.

4,532,175
COLLECTOR MEMBRANE

Ronald E. Johnson, Tioga, Pa.; Lawrence S. Rajnik, Corning, and Lung-ming Wu, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 22, 1983, Ser. No. 524,401
Int. Cl.³ B41F 17/00
U.S. Cl. 428—220 3 Claims

1. A collector membrane for receiving a thermoplastic, pressure-sensitive ink formulation in the form of a design by intimate contact with a surface carrying such design, and for depositing the design onto another surface by intimate mechanical contact therewith, comprising:

a membrane body formed of room temperature vulcanizing silicon material,

said silicone material being formulated to have a tensile strength of at least 50 psi and an elongation of at least 150%, as measured in accordance with ASTM D-412,

said membrane being between about 0.03" and 0.09" thick and being formulated from a silicone material including about 30 to about 50 parts per weight of dimethyl siloxane oil,

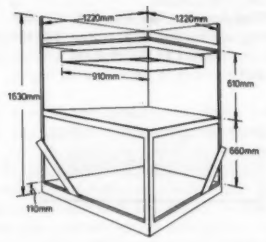
said dimethyl siloxane oil having a viscosity between 20 and 1,000 centistokes, and

said membrane having a hardness of about 50 to 75 points as measured on a shore-OO durometer gauge.

4,532,176
FIBROUS MATERIAL COMPRISED OF VERMICULITE COATED FIBERS

Peter J. Briggs, Cheadle Hume, and Kevin McAloon, Appleton Thorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 545,104, Oct. 24, 1983, Pat. No. 4,472,478, which is a continuation of Ser. No. 281,107, Jul. 7, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,574
Claims priority, application United Kingdom, Jul. 11, 1980, 8022713
Int. Cl.³ D02G 3/00
U.S. Cl. 428—288 6 Claims



1. A non-combustible fiber coated with lamellae of chemically delaminated vermiculite, the lamellae having a thickness of less than 0.5 micron and an aspect ratio of at least 10.

6. A fibrous material comprising an assembly of individual non-combustible fibers each fiber having thereon a coating of lamellae of chemically delaminated vermicultie having a thickness of less than 0.5 micron and an aspect ratio of at least 10.

4,532,177
BASE COAT COMPOSITIONS FOR WET-ON-WET APPLICATIONS, AND ARTICLES COATED THEREWITH

Ralph W. Mahar, Southport, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,777
Claims priority, application United Kingdom, Apr. 2, 1984, 8408450
Int. Cl.³ C08K 3/08; C08L 1/14, 67/02, 91/08
U.S. Cl. 428—328 6 Claims

1. A base coat composition comprising a film-forming, curable resin component selected from one or a mixture of any of polyester, acrylic and polyurethane resins, having blended therewith from 1.0 to 15.0% by weight of pigment and from 2.0% to 50.0% by weight of cellulose ester material having the following chemical characteristics:

Solution Viscosity, seconds—0.05–0.005
Acetyl, % by wt.—10.0–15.0
Propionyl, % by wt.—0.1–0.8
Butyryl, % by wt. 36.0—40.0
Free-Hydroxyl, % by wt.—1.0–2.0.

6. A substrate having a multilayer coating composition adhered hereto, said composition comprising:

A. a dried nonaqueous base film of the composition of any of claims 1–4; and

B. a baked transparent coating composition deposited on said base film and comprising a film-forming material selected from polyester resins and polyurethane resins.

4,532,178
MAGNETIC RECORDING MEDIA COMPRISING A MAGNETIC LAYER ON ONE SIDE OF A SUPPORT AND A NON-MAGNETIC TIO LAYER ON THE OTHER SIDE

Yukio Matsumoto, Mito, Japan, assignor to Victor Company of Japan, Ltd., Japan

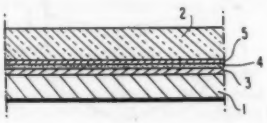
Filed Jul. 27, 1983, Ser. No. 517,713
Claims priority, application Japan, Jul. 29, 1982, 57-131154
Int. Cl.³ G11B 5/72
U.S. Cl. 428—328 6 Claims

1. A magnetic recording medium which comprises a support, a magnetic recording layer formed on one side of said support, and a non-magnetic layer formed on the other side of said support, wherein said non-magnetic layer comprises TiO.

4,532,179
METAL-CERAMIC BONDED MATERIAL

Akio Takami; Toshitaka Matsuura; Kazutoshi Tanaka, and Toshifumi Sekiya, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Filed Apr. 8, 1983, Ser. No. 483,302
Claims priority, application Japan, Apr. 10, 1982, 57-60105
Int. Cl.³ B32B 9/00
U.S. Cl. 428—335 14 Claims

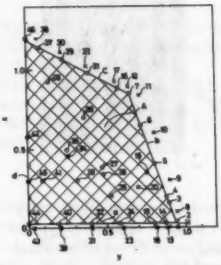


1. A metal-ceramic bonded material, wherein a metal member consisting essentially of a base material, a metal film and an oxide film of a thickness less than about 50μ as an upper layer is bonded to a ceramic member by a heat-resistant inorganic adhesive so that the surface of the oxide film of said metal member faces the surface of the ceramic member and the oxide film acts to provide a sliding function between the metal film and the heat-resistant adhesive.

4,532,180
GARNET FILM FOR ION-IMPLANTED MAGNETIC BUBBLE DEVICE

Norio Ohta, Sayama; Keikichi Ando, Musashino; Yuzuru Hosoe, Hachioji; Yutaka Sugita, Tokorozawa, and Fumihiko Ishida, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,806
Claims priority, application Japan, Mar. 5, 1982, 57-33859
Int. Cl.³ G11B 5/64
U.S. Cl. 428—336 5 Claims

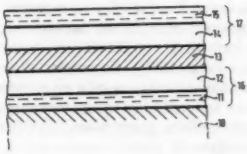


1. A garnet film which is formed on a non-magnetic single crystal substrate of garnet and which has an ion-implanted region in at least one desired position thereof; said garnet film having a composition expressed by the general formula $R_{3-x}Gd_xFe_{5-y}M_yO_{12}$, where R is Sm and at least one element selected from the group consisting of Y, Lu and Ca; M is at least one element selected from the group consisting of Ga and Ge; and the values of x and y are defined to be within a region A encompassed by or on a line (a) connecting point **44** (0.03, 0) and point **2** (0.03, 0.94), a line (b) connecting point **2** (0.03, 0.94) and point **7** (0.85, 0.65), a line (c) connecting point **7** (0.85, 0.65) and point **46** (1.20, 0) and line (d) connecting point **46** (1.20, 0) and point **44** (0.03, 0) in FIG. **3**; said ion-implanted region being formed by selectively implanting at least one kind of ions selected from the group consisting of hydrogen, deuterium, helium and neon ions into the desired portion of said garnet film.

4,532,181
MULTILAYER WEB FOR REDUCING LOSS OF RADIANT HEAT

Klaus Brill, Korntal, and Wolfgang Grothe, Tiefenbronn, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 420,813, Sep. 21, 1982, abandoned. This application Apr. 4, 1983, Ser. No. 481,864
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140100; European Pat. Off., Sep. 30, 1982, 82 109 036.2
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.³ B32B 15/08
U.S. Cl. 428—336 10 Claims



1. Multilayer protective web having high reflectivity for the

far infra-red spectral region and good transmissivity for the visible light and near infra-red spectral regions comprising a transparent carrier foil, a thin layer of a metal selected from the group of silver, gold aluminum and copper, and at least one dielectric covering layer of a thickness in the range from 15 to 40 nm, on each side of said metal layer all on the same side of said carrier foil, wherein, at least one of said dielectric covering layers has a bismuth oxide content such that bismuth constitutes between 10% and 85% by weight of the metal compound content of said covering layer, the remainder of the metal compound content of said dielectric layers being at least one compound, selected from the group consisting of oxides, nitrides and oxide nitrides of at least one metal selected from the group consisting of titanium, tin, lead, indium, zinc, tantalum, cerium and antimony.

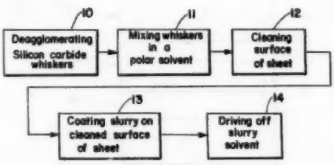
2. Multilayer web according to claim 1, in which said carrier foil is a polyester foil.

4,532,182

SILICON CARBIDE WHISKER SHEET COMPOSITES

Lewis A. Short, Piedmont, and Ottis J. Horne, Greer, both of S.C., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1981, Ser. No. 335,449
Int. Cl.³ B32B *17/12, 13/14*
U.S. Cl. 428—367 **10 Claims**



1. A composite sheet comprising a planar sheet substrate of metal, glass, plastic or ceramic coated with interspersed silicon carbide whiskers on at least one surface thereof, said silicon carbide whiskers having previously been deagglomerated in a polar slurry and being substantially uniformly dispersed upon said surface of said substrate and adherent to said surface by static or molecular attraction without the presence of any binder.

4,532,183

METHOD FOR PRODUCING MICROCAPSULES BY INTERFACIAL PHOTOPOLYMERIZATION AND MICROCAPSULES FORMED THEREBY

Dale R. Shackle, Chillicothe; Michael J. Cousin, Ashville, and Gary D. Pack, Waverly, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 13, 1983, Ser. No. 541,409
Int. Cl.³ B01J *13/02*; B32B *27/16*
U.S. Cl. 428—402.22 **12 Claims**

1. A method for producing microcapsules which comprises:

forming a dispersed system which includes an aqueous liquid vehicle as a continuous first phase, a plurality of discrete, oily capsule core entities dispersed in said liquid vehicle constituting a discontinuous second phase, said first phase having a first polymerizable monomer dissolved therein, and said second phase having a second polymerizable monomer dissolved therein and containing a polyisocyanate prepolymer as a emulsion stabilizing agent, and a photoinitiator provided in at least one of said first and second phases; said first monomer being a water soluble ethylenically unsaturated compound and said second monomer being an oil soluble ethylenically unsaturated compound; and

irradiating said dispersed system with a radiation source capable of inducing polymerization of said first and second monomers such that said first and second monomers react and form a polymeric wall around said discrete capsule core entities.

12. Microcapsules formed by the method of claim 1.

4,532,184

PRECIOUS METAL VAPORIZATION REDUCTION

Gary B. A. Schuster, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 23, 1983, Ser. No. 554,503
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—433 **8 Claims**

1. A bushing adapted to hold a mass of molten glass from which glass fibers are withdrawn, comprising a precious metal selected from the group consisting of platinum, iridium, rhodium and a combination thereof, having on its surface a flame sprayed coating comprising:

(a) a refractory material selected from the group consisting of MgO, ZrO_2, Al_2O_3, TiO_2, Cr_2O_3, aluminides, silicides, borides and a combination thereof; and

(b) a calcia-aluminosilicate glass, said glass being present in an amount effective to decrease the vaporization of said precious metal.

4,532,185

ANTISTATIC FILMS

Robert J. Balchunis, and Frank T. Sher, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 363,870, Mar. 31, 1982, Pat. No. 4,463,114.
This application May 9, 1984, Ser. No. 608,388
Int. Cl.³ C08L *83/06*
U.S. Cl. 428—447 **21 Claims**

1. A composite structure comprising:

(a) a substrate, and

(b) a cured film on at least one surface of said substrate, said film comprising the cured reaction product of 1 to 95 weight percent of a hydrolyzate of a hydroxyorganosilane and 5 to 99 weight percent of an aqueous solvent, said hydroxyorganosilane having the general formula:

$$R^1—Si(OR^2)_3$$

wherein

R^1 is a di-hydroxy- or polyhydroxy-substituted organic group selected from:

(1) alkyl groups containing from 2 to about 8 carbon atoms and substituted by 2 to 7 hydroxy groups, with any single carbon atom having at most one hydroxy group attached;

(2) alkyl groups and cyclic alkyl groups having 2 to 20 carbon atoms, which carbon chain may be interrupted by one or more oxygen atoms and containing at least two hydroxyl groups per 8 carbon atoms with any single carbon atom having at most one hydroxy group attached;

(3) aralkyl or alkaryl groups containing 7 to 10 carbon atoms, said aralkyl or alkaryl group having 2 to 8 hydroxy groups, with any single carbon atom having at most one hydroxy group attached;

(4) alkenyl groups containing 4 to 8 carbon atoms and 2 to 5 hydroxy groups with any single carbon atom having at most one hydroxy group attached;

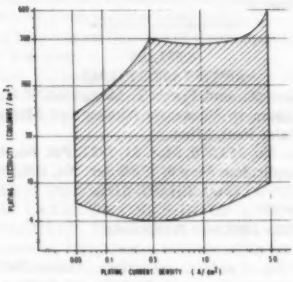
(5) cyclic or alkyl-substituted cyclic groups having 3 to 8 carbon atoms and substituted by 2 to 7 hydroxy groups, with any single carbon atom having at most one hydroxy group attached; and

(6) those groups selected from the group consisting of epoxy, ketal, acetal and ester which, on exhaustive hydrolysis, provide the aforementioned dihydroxy or polyhydroxyalkyl groups, and

R^2 is selected from

(1) hydrogen, and
(2) any organic group such that the $-Si(OR^2)_3$ moiety is hydrolyzable.

4,532,186
CIRCUIT SUBSTRATE WITH RESISTANCE LAYER AND PROCESS FOR PRODUCING THE SAME
Kazuyoshi Shibagaki; Yoshihisa Mori, and Takahiko Moriuchi, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 16, 1983, Ser. No. 505,126
Claims priority, application Japan, Jun. 16, 1982, 57-104592; Dec. 4, 1982, 57-212948
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—457 4 Claims



1. A circuit substrate with a resistance layer comprising an electrically insulating layer, a resistance layer bonded to at least one surface of the electrically insulating layer and a highly conductive material layer bonded to the resistance layer, wherein the resistance layer comprises an alloy containing 30 to 85% by weight of tin, and 70 to 15% by weight of nickel, each based on the total weight of tin and nickel, and sulfur in an amount corresponding to a relative strength ratio to nickel contained of 5 to 70% determined by the ESCA measurement.

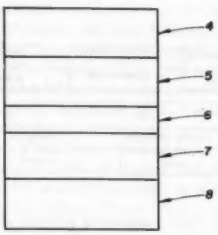
4,532,187
POLYOLEFIN RESIN BLENDS WITH ENHANCED ADHESION AND LAMINATES
Stephen M. Hoenig, Angleton; David P. Flores, Lake Jackson, both of Tex., and Sally P. Ginter, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 610,207, May 14, 1984, abandoned, which is a division of Ser. No. 392,969, Jun. 28, 1982, Pat. No. 4,474,928. This application Sep. 14, 1984, Ser. No. 650,589
Int. Cl.³ B32B *15/08, 27/06/27/08*
U.S. Cl. 428—457 11 Claims

1. A laminate of at least two dissimilar layers wherein one layer is a resin blend comprising a polyolefin and an effective amount of a poly-2-oxazoline such that there is a detectable difference in bond strength between a resin blend without the poly-2-oxazoline and the resin blend with the poly-2-oxazoline with respect to the same substrate material.

4,532,188
ELECTRICALLY CONDUCTIVE PYRROLE COPOLYMER ARTICLE
Herbert Naarmann, Wattenheim; Gernot Koehler, and Johannes Schlag, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 16, 1983, Ser. No. 504,723
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223545
Int. Cl.³ B32B *27/00*; C25B *11/00*
U.S. Cl. 428—500 4 Claims

1. An electrically conductive copolymer which comprises: one or more layers of a polypyrrole or a copolymer of pyrroles and alkynes and/or aromatics, and, chemically bonded to this, one or more layers consisting of an electrically conductive polyalkyne.

4,532,189
LINEAR POLYETHYLENE SHRINK FILMS
Walter B. Mueller, Taylors, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.
Continuation of Ser. No. 350,459, Feb. 19, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,230
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—516 14 Claims

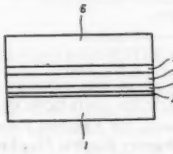


1. A multi-layer film comprising:
a core layer comprising linear low density polyethylene or linear medium density polyethylene;
two skin layers comprising a blend of from 70% to 90%, by weight, of an ethylene propylene copolymer and from 10% to 30%, by weight, of a propylene homopolymer; and
wherein said film has an average machine direction free shrink at 200° F. of at least about 12% and an average transverse direction free shrink at 200° F. of at least about 17%.

4,532,190
METAL-CERAMICS COMPOSITE MATERIALS
Rokuro Kanbe, Aichi, and Kazuo Kimura, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan
Filed Sep. 23, 1983, Ser. No. 535,050
Claims priority, application Japan, Sep. 25, 1982, 57-167030
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—627 15 Claims

1. A metal-ceramic composite material, comprising:
a ceramic substrate,
a metal film formed on a surface of said ceramic substrate, comprising:
a first layer formed on the surface of the ceramic substrate by gas deposition, consisting essentially of at least one of titanium, zirconium, hafnium and an alloy thereof;
a second layer formed on the first layer by gas deposition, consisting essentially of at least one of chromium, molybdenum, tungsten and an alloy thereof;
a third layer formed on the second layer by one of gas deposition and electrochemical plating, consisting es-

sentially of at least one of copper, silver, gold and an alloy thereof; and



a metal member consisting essentially of at least one of copper, gold, silver, platinum and an alloy thereof, laminated onto said metal film.

4,532,191

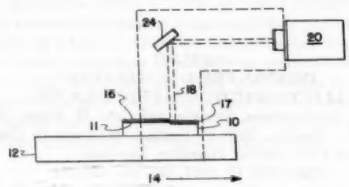
MCRALY CLADDING LAYERS AND METHOD FOR MAKING SAME

Michael J. Humphries, Ironia; Chih-an Liu, Edison, and Richard C. Krutenat, New Providence, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 421,246, Sep. 22, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 625,038

Int. Cl.[3] **B05D** *1/08, 3/06;* **B32B** *15/00;* **C23C** *5/00*

U.S. Cl. 428—678 **41 Claims**



33. An oxidation resistant laser cladded substrate comprising:

a metallic substrate having a carbon content of less that about 0.2%;

an alloy layer of MCrAlY coating where M is iron, cobalt, nickel or a combination thereof and Al content is less than about 6.0%, said layer including a metallurgical bonding region adjacent to said substrate containing about 5% to about 50% of materials contained in said substrate whereby said alloy layer is metallurgically bonded to said substrate.

4,532,192

FUEL CELL SYSTEM

Bernard S. Baker, Brookfield Center, and Hossein G. Ghezel-Ayagh, Fairfield, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Nov. 6, 1984, Ser. No. 668,703

Int. Cl.[3] **H01M** *8/06*

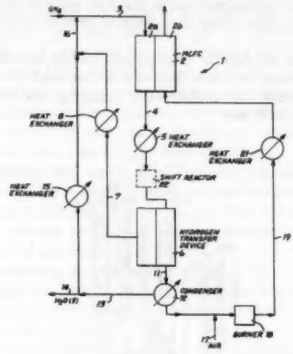
U.S. Cl. 429—19 **21 Claims**

1. A fuel cell system adapted to receive fuel having hydrocarbon content from a fuel supply, said fuel cell system comprising:

a fuel cell including: means internal of the cell for reforming said hydrocarbon content of said fuel from said supply to produce fuel process gas; and

anode and cathode sections for receiving fuel process gas and oxidant process gas;

and means for receiving the gas exhausted from said anode section and for separating from said exhaust gas fuel process gas contained in said exhausted gas to the exclusion of the other gases contained in said exhaust gas, to thereby



provide separated fuel process gas and remaining exhausted gas.

4,532,193

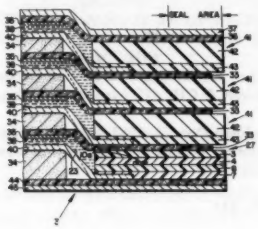
VENTED FRAME FOR LAMINAR BATTERIES AND METHODS OF MAKING THE SAME

Alfredo G. Kniazzeh, West Newton; Dennis R. Mailloux, Westminster, and Kestutis Norvaisa, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 18, 1977, Ser. No. 852,921

Int. Cl.[3] **H01M** *2/12*

U.S. Cl. 429—82 **13 Claims**



1. In the method of making vented battery frames, the steps of embedding at least one elongated strip, consisting essentially of paper, between confronting sheets of thermoplastic sheet material by adhering the confronting thermoplastic sheets together to thereby enclose the strip in a thermoplastic matrix, and cutting windows through the adhering sheets alongside and spaced from said strip to form a ladder of vented battery frames.

4,532,194

HOUSING FOR A BATTERY OPERATED TRANSCEIVER

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, and David L. Maloney, Barrington, both of Ill., assignors to James P. Liautaud, Cary, Ill.

Filed Sep. 7, 1983, Ser. No. 530,050

Int. Cl.[3] **H01M** *2/10*

U.S. Cl. 429—99 **9 Claims**

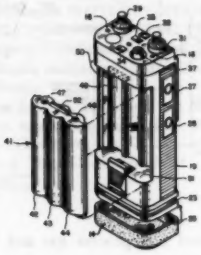
1. A housing for a battery operated portable transceiver, comprising:

a battery pack including a battery pack housing, said battery pack housing defining a chamber for receiving a battery

and having a pair of apertures for providing access to terminals on said battery;

an elongated generally rectangular main housing portion having a recess-portion in the rear surface thereof, said recess-portion being dimensioned to receive said battery pack;

detachable mechanical engagement means including a pair of electrical contacts disposed within said recess at one end thereof for mechanically engaging one end of said battery pack; and



user-actuable latch means at the other end of said recess for engaging the other end of said battery pack to retain said battery pack within said recess-portion of said main housing portion;

said electrical contacts being located as to project through said apertures and into contact with said terminals to provide electrical communication between circuitry contained within said main housing portion and said battery pack when said battery pack is received in said recess-portion.

4,532,195

ELECTROCHEMICAL STORAGE CELL COMPRISING AN ANODE AND A CATHODE MADE OF A SYNTHETIC POLYMER

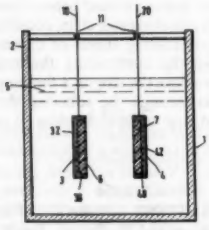
Gert Weddigen, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & CIE AG, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,874

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248076

Int. Cl.³ H01M *10/40*

U.S. Cl. 429—213 **4 Claims**



1. Rechargeable electrochemical storage cell comprising a housing, in the interior of which is an anode and a cathode spaced from each other and both provided with a core of graphite felt saturated with a soluble synthetic polymer which has triaromatic units as basic modules and is non-conjugated along a main chain thereof, surrounded by a a liquid electrolyte selected from the group consisting of lithium iodide dissolved in tetrahydrofuran and sodium iodide with diglyme as a solvent, wherein the polymer of the anode has OH-groups and is doped with a member selected from the group consisting of an alkali metal and an earth alkali metal, and monoisocyanate is added to said anode polymer to convert the OH-groups into urethane groups, and wherein the polymer of the cathode is doped with a chalcogen.

4,532,196

AMORPHOUS SILICON PHOTORECEPTOR WITH NITROGEN AND BORON

Masaru Yasui, Yokohama, and Kazuhisa Kato, Atsugi, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 342,650, Jan. 25, 1982, abandoned. This application Feb. 14, 1984, Ser. No. 579,285

Int. Cl.³ G03G *13/22, 5/082, 5/09*

U.S. Cl. 430—31 **8 Claims**

1. A process for electrophotography comprising:

providing on a substrate a layer of amorphous silicon having a dark conductivity of less than about 10^{-12} $(\text{ohm cm})^{-1}$,

charging the surface of said layer to an electrical potential above about 500 volts, said charge being retained on said surface for a half-life of at least 15 seconds as a result of said low dark conductivity value without the use of a charge transport layer, and

selectively exposing said layer to light so as to form a latent image represented by the residual charge on said layer, and wherein said step of providing comprises:

forming said amorphous silicon (a-Si) layer on said substrate by a plasma chemical vapor deposition (CVD) technique using silane and both boron and nitrogen containing gasses.

4,532,197

INTENSE PRE-ILLUMINATION ELECTROPHOTOGRAPHIC PROCESS

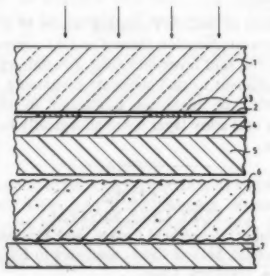
Victor C. Humberstone, Sawston, and John H. Fisher, Whaddon, Nr. Royston, both of England, assignors to Comtech Research Unit Limited, Hamilton, Bermuda

Filed May 17, 1983, Ser. No. 495,251

Claims priority, application United Kingdom, May 18, 1982, 8214428

Int. Cl.³ G03G *13/052, 13/22*

U.S. Cl. 430—41 **6 Claims**



1. A method of forming an image on a transparent electrophotographic or image migration film by a contact printing technique, which comprises:

(a) placing an image-bearing master in surface to-surface contact with the film;

(b) exposing the film to light through the image-bearing master, the exposure being at least 500 times greater than the minimum necessary to render conductive the photoconductive layer of the electrophotographic film;

(c) applying a substantially uniform charge to the surface of the film in the dark immediately after exposure;

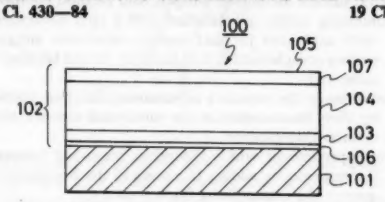
(d) leaving the film in the dark for a short time so as to allow the charge to migrate selectively; and
(e) then developing the image.

4,532,198

PHOTOCONDUCTIVE MEMBER

Keishi Saitoh, Tokyo, and Kozo Arao, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,565
Claims priority, application Japan, May 9, 1983, 58-81107; May 10, 1983, 58-81133; Jun. 1, 1983, 58-97179
Int. Cl.³ G03G *5/08, 5/082;* **B05D** *5/12;* **H01L** *45/00*
U.S. Cl. 430—84 **19 Claims**



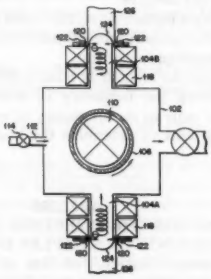
1. A photoconductive member, comprising a support for photoconductive member and a light receiving layer with a layer constitution, comprising a first layer region containing at least germanium atoms of which at least a portion is crystallized, a second layer region comprising an amorphous material containing at least silicon atoms and germanium atoms, a third layer region comprising an amorphous material containing at least silicon atoms and exhibiting photoconductivity, and a fourth layer region comprising an amorphous material containing silicon atoms and carbon atoms provided successively in the order mentioned from the said support side.

4,532,199

METHOD OF FORMING AMORPHOUS SILICON FILM

Tsuyoshi Ueno, Fujisawa; Katsumi Suzuki, Tokyo, and Masataka Hirose, Hiroshima, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 27, 1984, Ser. No. 583,855
Claims priority, application Japan, Mar. 1, 1983, 58-33385
Int. Cl.³ G03G *5/082*
U.S. Cl. 430—128 **5 Claims**



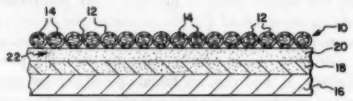
1. A method of manufacturing an electrophotographic photoconductive drum comprising the steps of:
(a) providing at least one plasma generation chamber;
(b) providing a reaction chamber which communicates with, and is spaced apart from, said at least one plasma generation chamber, and in which a rotatable drum having an electrically conductive substrate formed on the cylindrical surface thereof is disposed;
(c) exciting, in said plasma generation chamber, a plasma generating gas consisting of hydrogen gas or a mixture of hydrogen gas and nitrogen gas by electron cyclotron resonance generated by an alternating electric field and a magnetic field, thereby forming a plasma gas;
(d) introducing a raw material gas comprising a silicon atom-containing gas into said reaction chamber and directing the stream of said raw material gas toward said drum along a raw material gas feed direction;
(e) rotating said drum while introducing said plasma gas from said at least one plasma generation chamber into said reaction chamber in a plasma gas feed direction such that said plasma gas feed direction intersects with said raw material gas feed direction;
(f) continuing to rotate said drum while contacting said plasma gas stream with said raw material gas in said reaction chamber thereby converting said raw material gas into radicals; and
(g) forming a photoconductive film comprising amorphous silicon on said conductive substrate of said rotating drum by reaction of said radicals with said substrate surface.

4,532,200

PHOTOSENSITIVE IMAGING MATERIAL EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION HAVING IMPROVED TOE SPEED

Jonathan S. Arney, and Paul C. Adair, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 16, 1983, Ser. No. 552,569
Int. Cl.³ G03C *5/54, 1/68, 1/71*
U.S. Cl. 430—138 **11 Claims**



1. A self-contained photosensitive imaging material comprising:
a support;
a layer of microcapsules on said support, said microcapsules containing an internal phase including a photohardenable composition;
a color-forming agent associated with said microcapsules such that upon rupturing said microcapsules and releasing said internal phase said color-forming agent is mobilized;
a developer material capable of reacting with said color-forming agent and producing an image provided on the same surface of said support as said layer of rupturable microcapsules in a layer underlying said layer of microcapsules; and
means for sequestering a predetermined amount of said mobilized color-forming agent and preventing said predetermined amount of said color-forming agent from reacting with said developer material and forming an image; said means for sequestering being provided in a layer interposed said layer of microcapsules and said layer of developer material;
said photosensitive material being useful in forming images by image-wise exposing said material to actinic radiation and rupturing said microcapsules whereupon said color-forming agent is image-wise mobilized, a predetermined amount of said mobilized color-forming agent is sequestered, and the balance of said color-forming agent produces an image.

4,532,201
PROCESS AND AN APPARATUS FOR THE DEVELOPMENT OF PHOTOGRAPHIC TWO-SHEET DIFFUSION MATERIALS

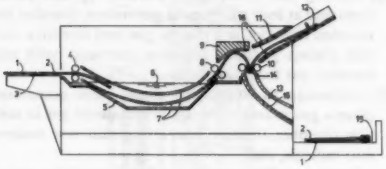
Immo Boie, Niederkassel, and Guido Kovacic, Unkel, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,074

Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316267

Int. Cl.³ G03C *5/54*

U.S. Cl. 430—202 **2 Claims**



1. A process for the development of photographic two-sheet diffusion materials, in which process a positive sheet and an exposed negative sheet are passed through a developing liquid and are then pressed together in order to transfer the image, characterised in that the positive sheet and the negative sheet are joined together flexibly and transversely to the direction of movement by an adhesive strip and are passed in tandem through the developing liquid for wetting, after the sheets have been guided through the developing liquid, the rigidity of the photographic material and the flexibility of the adhesive strip bending point are used together with a collecting device for the first-wetted sheet to produce a self maintaining V-shaped folding together of the sheets about the adhesive strip being point, and the two sheets are guided by a deflection device to a pair of pressing rollers, with the bending point, folded in V-shape, at the front, are taken up and pressed together by this pair of pressing rollers and are conveyed into a collecting tray.

4,532,202
COUPLER FOR PHOTOGRAPHY

Takashi Sasaki; Yutaka Kaneko; Fumio Ishii; Yasuo Tsuda; Kazuhiko Kimura, and Katsunori Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 564,241

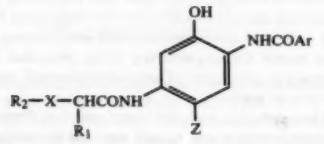
Claims priority, application Japan, Dec. 29, 1982, 57-232131

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—552 **10 Claims**

1. A light-sensitive silver halide photographic material comprising a support and, coated thereon, a silver halide emulsion layer which comprises a coupler for photography represented by the formula:



wherein R_1 represents a branched alkyl group having 3 to 5 carbon atoms; R_2 represents an aryl group; X represents a divalent linking group; Ar represents an aryl group; and Z is a hydrogen atom or a group eliminable through the coupling reaction with the oxidized product of an aromatic primary amine type color developing agent.

4,532,203
FLUORESCENT DETERMINATION OF MICROLYMPHOCYTOTOXICITY

Edwin F. Ullman, Atherton, and F. Carl Grumet, Stanford, both of Calif., assignors to SYVA Company, Palo Alto, Calif.

Filed Oct. 26, 1982, Ser. No. 436,770

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **3 Claims**

1. In a method for detecting the presence of cells having a specific surface membrane antigen, said method comprising:

combining viable cells labelled with a vital fluorescent dye with antibodies for said surface membrane antigen and adding complement to lyse antibody bound labelled viable cells; and

determining the presence of remaining labelled viable cells by their fluorescence in the substantial absence of extracellular fluorescence;

the improvement which comprises removing extracellular fluorescence by adding receptors to the fluorescer which quench the extracellular fluorescence.

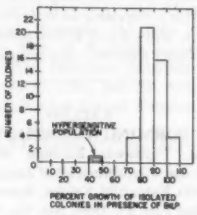
4,532,204
MUTATION ASSAYS INVOLVING BLOOD CELLS THAT METABOLIZE TOXIC SUBSTANCES

Charles L. Crespi, Downers Grove, Ill., and William G. Thilly, Winchester, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 19, 1982, Ser. No. 399,851

Int. Cl.³ C12Q *1/29;* **C12N** *15/00, 5/02;* **C12R** *1/91*

U.S. Cl. 435—29 **6 Claims**



1. A method for determining mutagenicity of a substance, comprising the steps of:

a. exposing a culture of AHH-1 cells to the substance;

b. thereafter growing the exposed AHH-1 cells for a phenotypic stabilization period;

c. detecting the amount of mutant cells; and

d. comparing the frequency of mutation of the exposed AHH-1 cells to the frequency of mutation of unexposed AHH-1 cells to determine the mutagenicity of the substance.

4,532,205
PROCESS FOR THE INJECTION OF VERY SMALL AMOUNTS OF SAMPLES INTO CELLS

Wilhelm Ansorge, Gaiberg, Fed. Rep. of Germany, assignor to Europaisches Laboratorium fur Molekularbiologie (EMBL), Heidelberg, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 460,101

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204040

Int. Cl.³ C12Q *1/24;* **C12N** *5/00*

U.S. Cl. 435—30 **10 Claims**

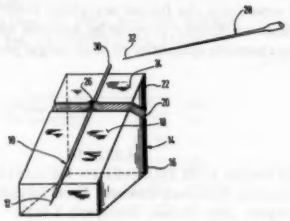
1. A method of injecting very small samples of fluid into cells using a microcapillary having an inside space, said mi-

crocapillary having a first end provided with a tip and a second end opposite said tip, said method comprising the steps of:

(A) filling said inside space with said sample fluid;

(B) applying an injection pressure to said inside space from said second capillary end;

(C) injecting a desired amount of sample fluid through said tip into a cell;



(D) reducing the pressure applied to said inside space after injection to a holding pressure that is lower than said injection pressure and greater than zero whereby substantially no sample fluid flows out from the tip; and

(E) maintaining said holding pressure until the beginning of the next injection.

4,532,206

β-STREPTOCOCCUS SELECTIVE MEDIUM

John M. Robinson, Tuscaloosa, Ala., and Gregory D. Rodgers, Ellisville, Mo., assignors to Vitek Systems, Inc., Hazelwood, Mo.

Filed Jul. 19, 1982, Ser. No. 399,782

Int. Cl.³ C12Q *1/29, 1/04, 1/14;* **C12N** *1/20*

U.S. Cl. 435—36 **7 Claims**

1. In a liquid selective medium for the identification of β-hemolytic streptococci in clinical samples containing a carbohydrate, a suitable protein source and reduced aniline blue indicator, wherein the improvement comprises employing pullulan as the carbohydrate source, in an amount of about 1.0 to about 8.0 gm/l, thereby allowing the growth of β-hemolytic streptococci only, without allowing the growth of enterococci and other non-β-hemolytic streptococci.

4,532,207

PROCESS FOR THE PREPARATION OF POLYPEPTIDES UTILIZING A CHARGED AMINO ACID POLYMER AND EXOPEPTIDASE

Stephen J. Brewer, High Wycombe, and Helmut M. Sassenfeld, Benson, both of England, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 3, 1983, Ser. No. 471,917

Claims priority, application United Kingdom, Mar. 19, 1982, 8208051

Int. Cl.³ C12P *21/00, 21/02, 21/04;* **C12N** *15/00*

U.S. Cl. 435—68 **22 Claims**

1. In a method of producing a polypeptide involving a structural gene contained in a cloning vehicle such as a plasmid expressed in a prokaryotic or eukaryotic cell and the isolation of the said structural gene polypeptide the improvement comprising:

(a) inserting adjacent to the said structural gene at either end or at both ends a DNA sequence coding for a polymer of charged amino acids;

(b) expressing the said structural gene polypeptide and charged amino acid polymer as a fusion product;

(c) separating the said fusion product from contaminants based upon the properties of the said polymer of charged amino acids;

(d) removing the said polymer of charged amino acids using an exopeptidase.

4,532,208

CONSTITUTIVE GLUCOSE ISOMERASE PRODUCER

Edmund W. Hafner, Arlington Heights, and Denise M. Jackson, Chicago, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 5, 1983, Ser. No. 491,835

Int. Cl.³ C12P *19/24;* **C12N** *9/92, 1/20;* **C12R** *1/465*

U.S. Cl. 435—94 **7 Claims**

1. A biologically pure culture of mutant microorganisms of Streptomyces coelicolor having the ability to produce a glucose isomerase in the absence of xylose in an amount at least as great as that produced by the parent microorganism in the presence of xylose, when the microorganisms are grown aerobically in a medium containing an assimilable source of carbon, nitrogen, and mineral nutrients at a temperature from 20° C. to about 45° C.

4,532,209

PRODUCTION OF PARA-CRESOL

Scott Hagedorn, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,129

Int. Cl.³ C12P *7/22, 7/42;* **C12R** *1/40*

U.S. Cl. 435—156 **5 Claims**

1. A process for the production of p-cresol which comprises providing a reaction medium comprising an aqueous solution of 4-methylcyclohexa-3,5-diene-1,2-diol-1-carboxylic acid by conversion of P-xylene with the microorganism, *Psudomonas putida* Biotype A strain ATCC No. 39119 and increasing the acidity of the aqueous solution to a pH level of less than about 3 sufficient to convert said 4-methylcyclohexa-3,5-diene-1,2-diol-1-carboxylic acid to p-cresol at a temperature between about 0°–100° C.

4,532,210

PROCESS FOR PRODUCING HYDROGEN BY ALGA IN ALTERNATING LIGHT/DARK CYCLE AND ENVIRONMENTAL AEROBIC/MICROAEROBIC CONDITIONS

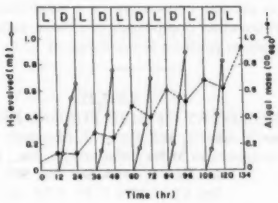
Yoshiharu Miura, 1-700, Megamiyama-cho, Koyoen, Nishinomiya, Hyogo, Osaka; Kazuhisa Miyamoto, 33-13, Higashi-Awaji 4-chome, Higashi-Yodogawa-ku, Osaka, Osaka, and Kiyohito Yagi, Sakurai-so, 1-8-11, Niina, Minoo, Osaka, all of Japan

Filed Sep. 27, 1982, Ser. No. 424,767

Claims priority, application Japan, Oct. 8, 1981, 56-161500; Feb. 4, 1982, 57-17132

Int. Cl.³ C12P *3/00*

U.S. Cl. 435—168 **31 Claims**



1. A process for producing hydrogen by an alga in an alternating light/dark cycle, comprising the steps of:

alternately cultivating the alga in water under aerobic conditions in the presence of light to accumulate photosynthesis products including starch in the alga and cultivating the alga in water under microaerobic conditions in the dark to decompose accumulated material including starch by photosynthesis to evolve hydrogen; and

recovering the thus evolved hydrogen.

4,532,211

COLIFORM BACILLUS HAVING A GENE FOR THE PRODUCTION OF STAPHYLOKINASE AND A PROCESS FOR PRODUCTION OF STAPHYLOKINASE THEREWITH

Tomoyuki Sako; Saeko Sawaki; Toshizo Sakurai; Masahiko Mutai, and Isamu Kondo, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,503

Claims priority, application Japan, Oct. 16, 1981, 56-164064

Int. Cl.[3] **C12P** *21/00, 21/02, 21/04;* **C12N** *9/48, 9/50, 1/20, 1/00, 15/00;* **C07H** *21/04*

U.S. Cl. 435—172.3 **33 Claims**

1. A coliform bacillus having a periplasmic space, comprising: a recombinant DNA carrying genetic information capable of producing staphylokinase which accumulates in high concentrations in the periplasmic space of said coliform bacillus, said genetic information being DNA derived from a temperate phage DNA of *Staphylococcus aureus.*

31. A method for obtaining a coliform bacillus capable of producing staphylokinase, comprising the steps of:

(a) digesting a temperate phage DNA of *Staphylococcus aureus* as a donor with one or more restriction enzymes to obtain donor DNA fragments;

(b) cleaving a vector DNA with one or more restriction enzymes;

(c) inserting the fragment obtained in step (a) into the cleaved site of the vector DNA obtained in step (b) to obtain recombinant DNA;

(d) introducing the thus obtained recombinant DNA into a coliform bacillus host; and

(e) selectively separating transformed coliform bacillus cells which possess the capability of producing staphylokinase.

4,532,212

PROCESS FOR THE DISSOLUTION OF PEPTIDES IN NON-AQUEOUS AND MIXED NON-AQUEOUS/AQUEOUS SYSTEMS

Barbara Odell, Landor Court, England, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 26, 1984, Ser. No. 624,570

Claims priority, application United Kingdom, Jun. 29, 1983, 8317697

Int. Cl.[3] **C12H** *9/18, 9/20, 9/50;* **C07G** *7/00*

U.S. Cl. 435—197 **13 Claims**

1. A process for the dissolution of one or more peptides containing four or more amino acids in a non-aqueous solvent or a mixed non-aqueous/aqueous solvent which comprises dissolving the peptides in a nonaqueous or mixed nonaqueous-/aqueous solvent comprising as a solubilizing agent one or more crown-ether compounds in a molar ratio of crown-ether compounds to peptides in the range of 10 to 100,000.

4,532,213

RECOVERY OF ACID FUNGAL PROTEASE

Jayarama K. Shetty, and James J. Marshall, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 8, 1983, Ser. No. 559,341

Int. Cl.[3] **C12N** *9/34, 9/58, 9/62*

U.S. Cl. 435—225 **7 Claims**

1. A method for the recovery of acid fungal protease produced during the fermentation in an aqueous nutrient medium of a fungus capable of producing extracellular glucoamylase and acid fungal protease which method comprises the steps of:

(a) introducing the fungus to the aqueous media and allowing it to grow at a pH of from about 2.0 to 4.8 under conditions which result in the production of extracellular glucoamylase and acid fungal protease which acid fungal protease is associated with fungal mycelium produced during the fermentation;

(b) separating the fungal mycelium and acid fungal protease associated therewith from the aqueous medium by liquid/-solid separating techniques;

(c) resuspending the fungal mycelium in an aqueous medium and adjusting the pH to a level of from about 5.0 to 6.5 to facilitate the dissociation of the fungal mycelium and the acid fungal protease associated therewith thereby causing the acid fungal protease to enter the aqueous medium; and

(d) separating the fungal mycelium from the aqueous medium to thereby provide an aqueous medium containing recoverable quantities of acid fungal protease.

4,532,214

METHOD FOR ISOLATION OF AMINOACYLASE

Bèla Szajàni, Budapest; Jànosnè Kiss, Szeged; Jòzsefnè Ivony, Budapest; Irèn Huber, Budapest; Làszlò Boros, Budapest, and Ivàn Daròczi, Budapest, all of Hungary, assignors to Reanal Finomvegyszergyar, Budapest, Hungary

Filed Jun. 3, 1982, Ser. No. 384,766

Int. Cl.[3] **C12N** *9/80, 11/08*

U.S. Cl. 435—228 **5 Claims**

1. A method for the isolation of aminoacylase enzyme from mammal kidneys which comprises

(a) making an aqueous extract of the mammal kidney by comminuting and homogenizing the mammal kidney in water and centrifuging the resulting homogenizate to separate a supernatant as the aqueous kidney extract;

(b) heating the aqueous kidney extract from step (a) at about 70° C. for 5 to 15 minutes;

(c) centrifuging the heated aqueous kidney extract from step (b);

(d) adding to the supernatant fluid from centrifugation step (c) from 200 to 300 grams of a salt of the general formula

$$KxA$$

where K stands for a monovalent cation, A stands for the anion of a mineral acid and x stands for the valence of the anion, per liter of supernatant fluid from the centrifugation step, to form a salt containing liquid suspension;

(e) centrifuging the resulting salt containing suspension from step (d) to separate the solid from the liquid components of said suspension;

(f) dissolving the separated solids from the centrifugation step (e) in water;

(g) dialyzing the dissolved solids in water solution from step (f) against water; and

(h) recovering the active aminoacylase enzyme fractions from the dialyzed solution from step (g).

4,532,215

ISOLATION OF HEPATITIS A VIRUS STRAIN HM-175

Richard J. Daemer; Stephen M. Feinstone, both of Washington, D.C.; Ian D. Gust, Fairfield, Australia, and Robert H. Purcell, Boyds, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 7, 1982, Ser. No. 366,165

Int. Cl.[3] **A61K** *39/29*

U.S. Cl. 435—237 **3 Claims**

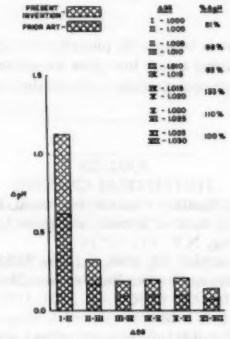
1. In the method for direct isolation of HAV taken from stool samples of humans with acute hepatitis A, and further isolating and propagating the virus in a suitable substrate, the step which comprises directly passaging said virus in African Green Monkey kidney culture cells to form a serological test or radioimmunoassay of anti-HAV.

4,532,216

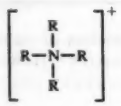
USE OF QUATERNARY AMMONIUM POLYELECTROLYTE SALTS IN TEST MEANS, TEST DEVICE AND METHOD FOR DETERMINING THE IONIC STRENGTH OR SPECIFIC GRAVITY OF A LIQUID SAMPLE

Joseph Y. Wang, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 27, 1982, Ser. No. 453,874
Int. Cl.[3] G01N *9/36, 31/04*
U.S. Cl. 436—2 35 Claims



1. In a test means for determining the ionic strength or specific gravity of an aqueous test sample, wherein said test means comprises a weakly acidic polyelectrolyte polymer, and an indicator means capable of producing a detectable response to ion exchange between said polyelectrolyte and said sample; the improvement wherein at least 50 percent of the acidic groups of said polyelectrolyte are present in the form of the salt of an ion having the structure



in which the R substituents, same or different, are hydrogen, lower alkyl or aryl, with the proviso that at least one of R be other than hydrogen.

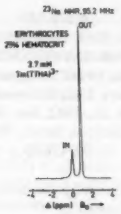
4,532,217

BIOLOGICAL USES OF SHIFT REAGENTS FOR THE NUCLEAR MAGNETIC RESONANCE OF PHYSIOLOGICAL METAL CATIONS

Charles S. Springer, Jr., E. Setauket, N.Y.; Martin M. Pike, Boston, Mass.; James A. Balschi, Centereach, N.Y.; David M. Yarmush, Brooklyn, N.Y., and Simon C. K. Chu, Centereach, N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Division of Ser. No. 408,253, Aug. 16, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 599,596
Int. Cl.[3] G01N *24/08*
U.S. Cl. 436—79 3 Claims

1. A method of shifting the nuclear magnetic resonance spectrum of alkali or alkaline earth metal ions which comprises adding to an aqueous solution of said ions a shift effective



amount of a chelate of dysprosium or thulium having a charge of at least −3.

4,532,218

IDENTIFICATION OF CARBON-CONTAINING IONS ADSORBED ON ION-EXCHANGE RESINS BY NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

E. Thomas Strom, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,548
Int. Cl.[3] G01N *24/08*
U.S. Cl. 436—82 5 Claims

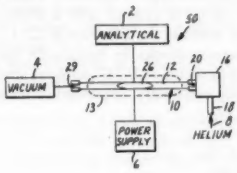
1. A process for the identification of a uranyl carbonate adsorbed on an anion-exchange resin and having a nuclear magnetic resonance active nucleus, said process comprising placing an anion-exchange resin suspected of having adsorbed a uranyl carbonate in a nuclear magnetic resonance tube with distilled water and then subjecting the anion-exchange resin in the nuclear magnetic resonance tube to C-13 Fourier transform nuclear magnetic resonance spectroscopic analysis to indicate the presence of a uranyl carbonate adsorbed on said resin.

4,532,219

HIGH FREQUENCY RADIATION-INDUCED PLASMA ANALYSIS OF VOLATILE OR NON-VOLATILE MATERIALS

Donald F. Hagen, Woodbury, and John S. Marhevka, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1984, Ser. No. 574,556
Int. Cl.[3] G01N *31/12*
U.S. Cl. 436—155 20 Claims



1. A method of analysis of an inorganic or organic material comprising the steps of:

(a) providing an immobilized sample of an inorganic or organic material in a gas atmosphere within a plasma cavity interfaced to an analytical device,

(b) initiating a high frequency sustained radiation-induced excitation plasma within said plasma cavity spaced apart from said sample to provide a stable radiation baseline,

(c) causing said plasma to elongate and encompass said sample for a length of time and at an energy level sufficient to pyrolyze said sample and cause it to emit radiation, and

(d) analyzing the resulting atomic and molecular constituents or their emitted radiation.

4,532,220
ASSAYS FOR THE DETERMINATION OF CARCINOGENICITY

Sara Lavi, Kiryat Ono, Israel, assignor to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Mar. 23, 1982, Ser. No. 361,061
Claims priority, application Israel, Mar. 25, 1981, 62479
Int. Cl.³ C12N *15/00*; C12Q *1/68*; G01N *33/50*
U.S. Cl. 436—501 **18 Claims**

1. A process for determining the carcinogenicity of chemical or physical agents, comprising:

exposing tumor virus transformed cells, capable of endogenous viral DNA replication upon carcinogen exposure, to the agent to be tested; and

determining whether the endogenous viral DNA content in such cells has been amplified,

whereby a positive determination of viral DNA amplification is indicative of positive carcinogenicity of the tested agent.

14. A process for determining the carcinogenicity of chemical of physical agents, comprising

exposing SV40 transformed Chinese hamster cells to the agent to be tested; and

determining whether the endogenous SV40 DNA content in such cells has been amplified,

whereby a positive determination of SV40 DNA amplification is indicative of positive carcigenicity of the tested agent.

4,532,221
DECORATIVE ENAMEL FOR GLASS-CERAMICS HAVING LOW COEFFICIENTS OF THERMAL EXPANSION

Pernette R. M. Barlier, Vulaines sur Seine; Gerard R. Boury, Nemours, and Jean-Pierre Mazeau, Avon, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,729
Claims priority, application France, Jun. 15, 1983, 83 09870
Int. Cl.³ C03C *3/10, 5/00, 3/22*
U.S. Cl. 501—22 **5 Claims**

1. A thermally crystallizable enamel composition suitable for application to glass-ceramic substrates having coefficients of thermal expansion less than 15×10^{-7}/°C., said enamel composition, upon crystallization, exhibiting the qualities of excellent adhesion to a glass-ceramic substrate, a lead release of less than 15 $\mu g/cm^2$, when in contact with a dilute solution of acetic acid (4% by volume) for 24 hours at 22° C., and resistance to repeated thermal shocks by heating to 620° C. followed by immersion into water at 10° C. without apparent degradation, and consisting essentially, expressed in weight percent on the oxide basis, of:

SiO_2: 36–58
Al_2O_3: 8.5–16
CaO: 0.5–10
PbO: 27–40
K_2O: 0.5–6.

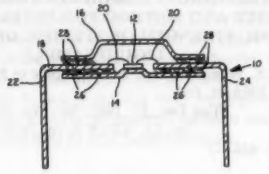
4,532,222
REINFORCED GLASS COMPOSITES

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 21, 1983, Ser. No. 477,552
Int. Cl.³ C03C *3/00*
U.S. Cl. 501—32 **19 Claims**

1. A reinforced glass, composite, comprising:

about 5% to 25% by volume of discrete particles in a glass matrix, said discrete particles comprising an organic polymer; and



said glass matrix being a tin-phosphorous-oxyfluoride composition having a very low glass transition temperature to prevent serious degradation of said discrete particles.

4,532,223
TINTED OPAL GLASSES

Pernette R. M. Barlier, Vulaines sur Seine, and Jean-Pierre Mazeau, Avon, both of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,993
Claims priority, application France, Jun. 21, 1983, 83 10237
Int. Cl.³ C03C *3/04, 3/08, 3/30*
U.S. Cl. 501—32 **6 Claims**

1. A sodium fluoride opal glass tinted in a shade lying in the range from "cream-white" to "beige" by an iron-sulfur system, said glass having a base composition consisting essentially, expressed in weight percent as analyzed, of

SiO_2	67–74	$Li_2O + Na_2O + K_2O$	8.5–15
B_2O_3	0–3	CaO	0.2–3
Al_2O_3	6.5–9.5	BaO	0–3.5
Li_2O	0–1.5	SrO	0–4
Na_2O	8.5–13	CaO + BaO + SrO	0.5–5
K_2O	0–2.4	ZnO	0–2.5
		F	3.5–6

characterized in that the analyzed quantities of sulfur (S), sulfide ions (S^{-2}), iron (Fe), and ferric ions (Fe^{+3}) conform to the following expressions:

$3 \leq S^{-2} \leq 1500$ ppm

$S^{-2}/S \geq 0.15$

$70 \leq Fe \leq 300$ ppm

$0.05 \leq Fe^{+3}/Fe^{+2} \leq 1$.

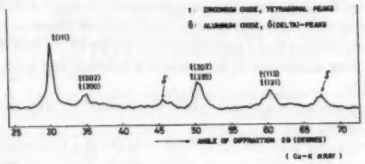
4,532,224
COMPOSITE CERAMIC POWDERS AND A METHOD OF MAKING THE SAME

Saburo Hori, Chiba, Japan, assignor to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,725
Claims priority, application Japan, Jan. 14, 1983, 58-3336
Int. Cl.³ C04B *35/10, 35/48*
U.S. Cl. 501—105 **3 Claims**

1. Composite ceramic spherical powders comprising fine particles of aluminum oxide and zirconium oxide dispersed within said fine particles of aluminum oxide wherein the average particle size of said fine particles of aluminum oxide is from 200 to 1000 Ångströms, the crystalline phase of said zirconium oxide exhibits only a tetragonal symmetry and the crystallite

diameter of zirconium oxide is from 40 to 80 Ångströms on the basis of the calculation of the width of a peak of an X-ray



diffraction, and wherein the content of zirconium oxide is from 10% to 25% by weight.

4,532,225

PREPARATION OF METAL-CONTAINING ZEOLITE CATALYSTS OF INCREASED STABILITY AND ACTIVITY

Ying-Yen P. Tsao, Langhorne, Pa., and Stephen S. Wong, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 465,854, Feb. 11, 1983, Pat. No. 4,472,517. This application Aug. 9, 1984, Ser. No. 639,273

Int. Cl.³ B01J *29/10, 29/28*

U.S. Cl. 502—62 **15 Claims**

1. A method of introducing a catalytically active metal into a crystalline aluminosilicate zeolite which comprises contacting said zeolite with a first organometallic complex of group IVA, group VIB or group VIIB metals to deposit said metal as a stabilizing center into said zeolite and subsequently contacting said zeolite with a second organometallic complex of said catalytically active metal, said second organometallic complex comprising pi-electron donating ligands, whereby said catalytically active metal is bound to said zeolite through said stabilizing center.

4,532,226

ZEOLITE CATALYSTS MODIFIED WITH GROUP VI A METAL

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 363,724, Mar. 30, 1982, abandoned, which is a continuation of Ser. No. 218,144, Dec. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 130,953, Mar. 17, 1980, Pat. No. 4,259,537. This application Jan. 5, 1984, Ser. No. 568,461

Int. Cl.³ B01J *29/36*

U.S. Cl. 502—71 **13 Claims**

1. A catalyst composition capable of selectively catalyzing alkylation, disproportionation or transalkylation reactions to selectively produce the 1,4-dialkylbenzene isomer in excess of its normal equilibrium concentration, said catalyst composition comprising:

(i) a crystalline zeolite material characterized by a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12;

(ii) at least 0.25 weight percent of a modifier capable enhancing the ability of said crystalline zeolite material (i) to selectively catalyze the production of said 1,4-dialkylbenzene isomer in said alkylation, disproportionation or transalkylation reactions, said modifier being selected from one or more Group VI A metals incorporated into the crystal structure of the zeolite in the form of the oxide of such metals; and

(iii) at least 0.25 weight percent phosphorus incorporated into the crystal structure of the zeolite in the form of phosphorus oxide.

2. The composition of claim 1 wherein said Group VI A metal is chromium.

3. The composition of claim 2 wherein said chromium comprises between 1 and 20 weight percent of said composition.

8. The composition of claim 1 wherein said zeolite is chosen from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 and ZSM-48.

4,532,227

LOW ASH PELLETED CARBON AND PROCESS OF PREPARATION

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 754,394, Dec. 27, 1976, abandoned. This application Dec. 22, 1980, Ser. No. 218,610

Int. Cl.³ B01J *21/18, 23/40;* **C01B** *31/02, 31/08*

U.S. Cl. 502—180 **14 Claims**

12. The method of preparing a low ash pelletted carbon from a high ash pelletted carbon containing 3%–10% non-volatile ash including silica and non-silicious components selected from the group consisting of sodium, magnesium, calcium, aluminum, iron, and phosphate which comprises

leaching said high ash pelletted carbon in contact with aqueous hydrochloric acid at 100° F.–250° F. thereby forming a reduced ash carbon;

leaching said reduced ash pelletted carbon in contact with aqueous hydrofluoric acid at 100° F.–250° F. thereby forming a low ash pelletted carbon containing less than 0.1% of non-volatile ash; and

recovering said low ash pelletted carbon.

13. A low ash pelletted carbon characterized by an ash content of less than about 0.1% of non-volatile ash and by a silica content of less than 0.1% prepared by the process of claim 12.

14. A low ash pelletted carbon characterized by an ash content of less than about 0.1% of non-volatile ash prepared by the method which comprises

leaching a high ash pelletted carbon in contact with hydrochloric acid thereby forming a reduced ash pelletted carbon;

leaching said reduced ash pelletted carbon in contact with hydrofluoric acid thereby forming a low ash pelletted carbon; and

recovering said low ash pelletted carbon.

4,532,228

TREATMENT OF MONOLITHIC CATALYST SUPPORTS

Carlo M. Golino, Caton; Irwin M. Lachman, and Lawrence A. Nordlie, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 19, 1984, Ser. No. 571,926

Int. Cl.³ B01J *21/04, 23/42, 23/44, 23/46*

U.S. Cl. 502—261 **11 Claims**

1. A method for fabricating a catalyst-coated, ceramic honeycomb structure, wherein the ceramic of said honeycomb structure contains microcracks, comprising the steps of:

(a) said honeycomb structure is infiltrated with a fluid containing a fugitive material selected from the group of an aqueous solution of an organic compound, an organic solution of a water insoluble organic compound, a liquid organic compound which can be irreversibly hardened through a chemical or thermal reaction, and a molten, water-insoluble organic compound which exists as a low-vapor pressure solid at ambient temperature to inhibit the entry of a subsequently-applied high surface area washcoat into said microcracks;

(b) the organic compound is solidified in the microcracks; solidification of said aqueous solution of an organic compound, said organic solution of a water-insoluble organic compound, said liquid organic compound which can be

irreversibly hardened through a chemical or thermal reaction, and said molten, water-insoluble organic compound which exists as a low vapor pressure solid at ambient temperature being achieved through firing in a non-oxidizing atmosphere at a sufficiently high temperature to carbonize it and thereby render it insoluble in water;

(c) a high surface area washcoat in the form of an aqueous slurry, which may optionally contain a catalyst-providing material, is applied to said support;

(d) the coated support is heated in an oxidizing atmosphere to a temperature sufficient to bind the particles of said washcoat together and to burn out or volatilize said fugitive material from the microcracks;

(e) where the washcoat in paragraph (c) does not contain catalyst-providing material, the coated support is impregnated with a solution containing a thermally decomposable compound which can provide a catalyst consisting of a base metal compound and/or metallic particles of a noble metal; and

(f) the coated support is heated in an oxidizing or reducing atmosphere to a temperature sufficient to provide a deposit of a catalytically-active base metal compound and/or metallic particles of a noble metal through thermal conversion of the thermally decomposable compound.

4,532,229

PROCESS FOR PREPARING A FE-CO CATALYST SLURRY SYSTEM FOR ALPHA OLEFIN PRODUCTION

Rocco A. Fiato, Scotch Plains; Gary B. McVicker, Califon, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,221

Int. Cl.³ B01J *21/04, 23/78*

U.S. Cl. 502—330 **18 Claims**

1. A process for preparing a slurry Fischer-Tropsch catalyst system comprising the steps of:

(a) heating a slurry mixture comprised of: a Fischer-Tropsch slurry liquid, an iron carbonyl compound, a cobalt carbonyl compound, or iron and cobalt compounds capable of forming carbonyl complexes in an atmosphere of CO, and mixtures thereof, and a powdered support, wherein said iron and cobalt compounds are present in a total iron:cobalt atomic ratio of about 35:1 to 1:10, taken as free metals, and wherein the cobalt carbonyl compound has a lower melting point/decomposition temperature than the iron carbonyl compound; in a carbon monoxide atmosphere under pressure, at a temperature above the melting point/decomposition temperature of the cobalt compound for a time sufficient to substantially decompose the cobalt compound; and

(b) heating said slurry mixture from step (a) at a temperature above the melting point/decomposition temperature of the iron compound in said CO atmosphere under pressure, to substantially decompose the iron compound; and

(c) heating said slurry mixture from step (b) in an atmosphere of hydrogen gas to substantially reduce said iron and cobalt carbonyl compounds and their decomposition products.

4,532,230

HIGH SURFACE AREA ThO_2 CATALYST AND METHOD OF PREPARING IT

Carlos A. Colmenares, Alamo; Gabor A. Somorjai, Berkeley, and Joseph J. Maj, Walnut Creek, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1983, Ser. No. 506,559

Int. Cl.³ B01J *23/12, 23/04*

U.S. Cl. 502—344 **15 Claims**

1. A method of synthesizing a sodium substitutional cation high surface area ThO_2 catalyst having a BET surface area of about 80–125 m^2/g, comprising:

(a) simultaneously mixing an aqueous solution of $Th(NO_3)_4.4H_2O$ having a concentration of about 0.50 to 1.75 molal and a solution temperature between about its boiling temperature and a temperature of about 15° C. less than its boiling temperature, with an aqueous solution of $Na_2CO_3.H_2O$ having a concentration of about 1.50 to 2.50 molal and a solution temperature between about its boiling temperature and a temperature of about 15° C. less than its boiling temperature, to produce a solution and solid $ThOCO_3$;

(b) separating said solid $ThOCO_3$ formed in step (a) from solution; and

(c) calcining said $ThOCO_3$ from step (b) at a temperature of about 225°–300° C. for about 40–55 hours to produce ThO_2.

4,532,231

PROCESS FOR PRODUCING A CATALYST

David W. Johnson, Stockton-on-Tees, England, assignor to Imperial Chemical Industries PLC, Great Britain

Filed Feb. 13, 1984, Ser. No. 579,645

Claims priority, application United Kingdom, Feb. 21, 1983, 8304749

Int. Cl.³ B01J *23/02, 23/50*

U.S. Cl. 502—347 **8 Claims**

1. A process in which a catalyst for the production of an alkylene oxide is produced by impregnating a composition comprising silver supported on a porous heat resisting support with a solution of an alkali metal compound in a liquid which comprises a solvent for the alkali metal compound which comprises at least 20% by weight of a component which can be converted by chemical reaction to gas or vapour only at a temperature below its boiling point or of a substance capable of forming such a component before evaporation, wherein said component is selected from the group consisting of polyethylene glycol, polypropylene glycol or a polyhydroxy compound, and removing the said component by chemical reaction, the boiling point of the said component being higher than the temperature of the said chemical reaction under the reaction conditions.

4,532,232

LECTIN-CONTAINING SEPARATION AGENT

Per-Olof Larsson, Lund; Klaus Mosbach, Furulund, both of Sweden, and Axel Borchert, Frankfurt am Main, Fed. Rep. of Germany, assignors to Pernovo AB, Perstorp, Sweden

PCT No. PCT/SE83/00147, § 371 Date Dec. 23, 1983, § 102(e) Date Dec. 23, 1983, PCT Pub. No. WO83/03776, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 19, 1983, Ser. No. 568,185

Int. Cl.³ B01J *20/24;* **B01D** *15/08;* **G01N** *33/54*

U.S. Cl. 502—403 **5 Claims**

1. A separation agent comprising a water insoluble solid selected from the group consisting of silica material and silicate material, said solid having lectin bound thereto, said lectin being bound to said solid via an alkylene chain, said alkylene chain having from 1 to 22 carbon atoms.

4. A separation agent according to claim 1 wherein said alkylene chain is interrupted by at least one atom selected from the group consisting of oxygen, sulfur and nitrogen.

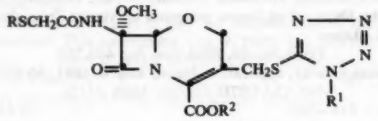
5. A separation agent according to claim 4 wherein said alkylene chain is bound to said solid via an intermediate second silicon atom.

4,532,233
FLUOROMETHYLTHIOOXACEPHALOSPORINS

Teruji Tsuji, Osaka; Hisao Sato, Nara, and Yoshio Hamashima, Kyoto, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 22, 1983, Ser. No. 564,553
Claims priority, application Japan, Dec. 23, 1982, 57-234472
Int. Cl.[3] A01N *43/90*; C07D *498/04*
U.S. Cl. 514—63 9 Claims

1. A 7β-(fluorinated methylthio)acetamido-7α-methoxy-3-[1-(2-hydroxyalkyl)-1H-tetrazol-5-yl]thiomethyl-1-dethia-1-oxa-3-cephem-4-carboxylic acid derivative represented by the following formula:



wherein

R is FCH_2— or F_2CH—;

R^1 is optionally protected 2-hydroxyalkyl; and

R^2 is hydrogen, a light metal atom, or a carboxy-protecting group.

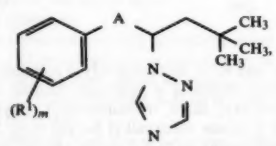
9. A method for combating bacteria which comprises bringing an antibacterially effective amount of the compound as claimed in claim 1 into contact with the bacteria.

4,532,234
NEOPENTYL-PHENETHYLTRIAZOLES, THEIR PREPARATION AND FUNGICIDES CONTAINING THESE COMPOUNDS

Ernst Buschmann; Guenter Schulz, both of Ludwigshafen; Gerd Hellen, Speyer; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,085
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233145
Int. Cl.[3] A01N *43/64, 55/00*; C07D *249/08*; C07F *7/18*
U.S. Cl. 514—63 3 Claims

1. An alpha-neopentyl-phenethyltriazole of the formula



(I)

where R^1 is C_1–C_4 alkyl, phenyl, CF_3, C_1–C_4 alkoxy or halogen, m is 0, 1, 2, 3 and A is C═X, CHY or CR^2R^3, where X is O or NOR^4, Y is OR^5, O-acetyl, O-propionyl, or O-benzoyl or $OSi(CH_3)_3$, R^2 is OH or OCH_3, R^3 is C_1–C_4 alkyl, phenyl, 4-CH_3-phenyl, 4-Cl-phenyl, 4-Br-phenyl, vinyl, benzyl or 4-Cl-benzyl and R^4 and R^5 are each H, C_1–C_6 alkyl benzyl, 4-F-benzyl, 4-CH_3-benzyl, allyl or propargyl or a plant-tolerated salt or metal complex thereof.

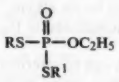
3. A process for combating fungi, wherein a fungicidally effective amount of a compound of the formula I is set forth in claim 1 is allowed to act on the fungi themselves, or on materials, plants or seed threatened by fungus attack.

4,532,235
O-ETHYL S-PROPYL S-S-BUTYL PHOSPHORODITHIOATE

Mohamed A. H. Fahmy, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 470,736, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 297,437, Aug. 28, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,424
Int. Cl.[3] A01N *57/12*; C07F *9/165*
U.S. Cl. 514—144 3 Claims

1. A compound of the formula



in which one R and R^1 is s-butyl and the other R and R^1 is n-propyl.

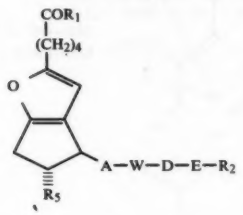
3. A method for controlling soil borne insects and nematodes which comprises applying to the soil in which agricultural crops are planted or are to be planted an insecticidal and nematicidal amount of the compound of claim 1.

4,532,236
CERTAIN PROSTACYCLINS AND THEIR BLOOD-PRESSURE-LOWERING AND THROMBOCYTE-AGGREGATION-INHIBITING COMPOSITIONS AND METHODS

Robert Nickolson; Helmut Vorbrueggen, both of Berlin; Jorge Casals-Stenzel, Mainz, and Martin Haberey, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE82/00222, § 371 Date Jul. 27, 1983, § 102(e) Date Jul. 27, 1983, PCT Pub. No. WO83/01951, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 25, 1982, Ser. No. 531,898
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147714
Int. Cl.[3] A61K *31/34, 31/557*; C07D *307/935*
U.S. Cl. 514—184 26 Claims

1. A prostacyclin derivative of the formula

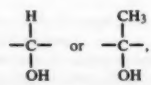


wherein

R_1 is OR_3, wherein R_3 is hydrogen; alkyl of 1–10 C-atoms; alkyl of 1–10 carbon atoms substituted by halogen, C_{6-10}-aryl, C_1–C_4-alkoxy, or C_1–C_4-dialkylamino; C_{4-10}-cycloalkyl; C_{6-10}-aryl; or an aromatic heterocyclic group of 5- or 6-ring atoms, one of which is O, N or S; or R_1 is NHR_4, wherein R_4 is hydrogen, C_{1-10}-alkanoyl, or C_{1-10}-alkanesulfonyl

A is —CH_2—CH_2— or trans—CH═CH—,

W is



wherein each OH-group can be esterified with benzoyl or

an alkanoic acid residue of 1–4 carbon atoms, or can be esterified with tetrahydropyranyl, tetrahydrofuranyl, C_1–C_4-alkoxyalkyl, or tri-(C_1–C_4-alkyl)-silyl, wherein the free, etherified or esterified OH-group can be in the α- or β-position,

D and E jointly mean a direct bond or

D is alkylene or alkenylene or up to 5 carbon atoms, optionally substituted by F or C_{1-4}-alkyl,

E is an oxygen atom or a direct bond,

R_2 is alkyl of 1–6 carbon atoms, or alkenyl of 2–6 carbon atoms, both of which can be substituted by phenyl, halogen, or C_1–C_4-alkyl, and, if D and E jointly represent a direct bond, R_2 can be an alkynyl residue of 2–6 carbon atoms, optionally substituted in the 1-position by halogen or C_1–C_4-alkyl,

R_5 is hydrogen which can be esterified with an alkanoic acid residue of 1–4 carbon atoms or which can be etherified with a tetrahydropyranyl, tetrahydrofuranyl, alkoxyalkyl, or trialkylsilyl residue,

or if R_3 is hydrogen, a salt thereof with a physiologically compatible base.

26. A method of lowering blood pressure in a patient comprising administering an amount of a compound of claim **1** effective to lower blood pressure.

4,532,237

SUBSTITUTED AND BRIDGED PYRIDINES USEFUL AS CALCIUM CHANNEL BLOCKERS

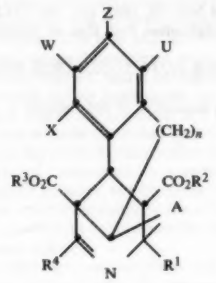
George D. Hartman, Lansdale, and Brian T. Phillips, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,954

Int. Cl.[3] **C07D** *265/12, 279/08, 413/12;* **A01N** *43/86*

U.S. Cl. 514—226 **10 Claims**

1. A compound represented by the following general structural formula (I):



(I)

wherein:

n is 0, 1 or 2;

A is oxygen or sulfur;

R^1 and R^4 independently are hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl;

R^2 and R^3 independently are C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 cycloalkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 dihydroxyalkyl, C_2–C_8 alkoxyalkyl, C_3–C_8 alkoxy(alkoxyalkyl), C_1–C_8 aminoalkyl wherein the amino group is NR^5R^6 in which R^5 and R^6 independently are hydrogen, C_1–C_8 alkyl, C_7–C_{14} phenylalkyl or R^5 and R^6 together with the N atom form a 5 or 6 membered heterocycle selected from the group consisting of piperidinyl, morpholinyl, thiomorpholinyl, pyrrolidinyl, piperazinyl or N'-C_1–C_4 -alkyl-piperazinyl; and

X, W, Z and U independently are hydrogen, C_1–C_8 alkyl, C_1–C_8 alkoxy, CF_3, cyano, nitro or halo, provided that at least two of X, W, Z and U are hydrogen or X and W or W and Z or Z and U together with the phenyl group to which they are attached form a naphthyl or benzoxadiazole group,

or a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition, useful in the treatment of cardiovascular disorders in which a high cellular concentration of Ca^{++} is a factor, comprising a nontoxic therapeutically effective amount of a compound according to claim **1** in an admixture with a pharmaceutically acceptable carrier.

4,532,238

FINELY PULVERIZED 2,4-DIAMINO-6-(2,5-DICHLORO-PHENYL)-1,3,5-TRIAZINE AND PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Hiroshi Enomoto, Nagaokakyo; Masanobu Kawamata, Kyoto; Akira Nomura, Hirakata; Yoshiaki Aoyagi, Otsu, and Fusao Ueda, Shiga, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Jul. 30, 1982, Ser. No. 403,702

Claims priority, application Japan, Aug. 4, 1981, 56-122876

Int. Cl.[3] **C07D** *251/18;* **A61K** *31/53*

U.S. Cl. 514—245 **25 Claims**

8. A pharmaceutical composition useful for the treatment of peptic ulcers in humans and animals which comprises a therapeutically effective amount of 2,4-diamino-6-(2,5-dichlorophenyl)-1,3,5-triazine or a pharmaceutically acceptable acid addition salt thereof in finely pulverized form so that the average particle diameter is 20 microns or less, in combination with a pharmaceutically acceptable carrier.

4,532,239

N-PHENOXYPROPANOL-N'-PYRIDAZINYL ETHYLENDIAMINES AS β-RECEPTOR BLOCKERS

Thomas Raabe, Rodenbach; Helmut Bohn, Schöneck; Piero A. Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany

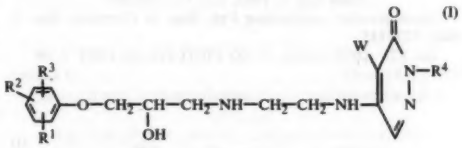
Continuation of Ser. No. 332,238, Dec. 18, 1981, abandoned. This application Dec. 20, 1983, Ser. No. 563,538

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048487

Int. Cl.[3] **C07D** *237/22;* **A61K** *31/50*

U.S. Cl. 514—247 **20 Claims**

1. A physiologically-active and pharmacologically-acceptable basically-substituted pyridazine of formula I



(I)

wherein

each of R^1, R^2 and R^3 is, independently, a member selected from the group consisting of hydrogen; fluorine; chlorine; bromine; hydroxyl; nitro; trifluoromethyl; alkyl having from 1 to 8 C atoms; alkoxyalkyl having from 2 to 6 C atoms; alkenyl having up to 6 C atoms; alkynyl having up to 6 C atoms; cycloalkyl having a ring size of from 5 to 8 C atoms; phenyl; alkoxy having from 1 to 8 C atoms; hydroxyalkoxy having from 2 to 6 C atoms; alkoxyalkoxy having a total of up to 8 C atoms; alkenyloxy having up to 6 C atoms; alkynyloxy having up to 6 C atoms; cycloalkoxy having a ring size of from 5 to 8 C atoms; benzyloxy; phenethoxy; alkanoyl having from 1 to 6 C atoms; acylamino having up to 11 C atoms in the acyl radical; an —NH—CO—R^9 radical, R^9 being a member selected from the group consisting of morpholino, piperidino, or 1-pyrrolidinyl; ureido; ureido which is monosubstituted in the 3-position by cycloalkyl having 5 or 6 C atoms; ureido which is monosubstituted or disubstituted in the 3-position

by alkyl having 1 to 6 C atoms and/or alkenyl having 3 to 6 C atoms;

R^4 is hydrogen or lower alkyl; and

W is a member selected from the group consisting of hydrogen, chlorine or bromine; or an acid-addition salt thereof.

4,532,240

DIAMINOPYRIMIDINES

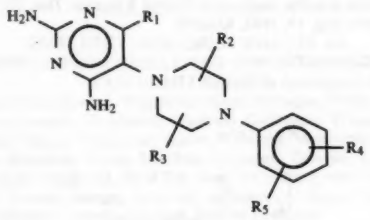
Leslie M. Werbel, and Jocelyn H. Hung, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 416,404, Sep. 9, 1982, abandoned. This application Aug. 9, 1983, Ser. No. 520,653

Int. Cl.³ A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—252 **32 Claims**

1. A compound having the structural formula I



where

A. R_1 is hydrogen or alkyl of from one to six carbon atoms;

B. R_2 and R_3 are independently hydrogen or methyl;

C. R_4 and R_5 are independently:

(1) hydrogen;

(2) halogen;

(3) nitro;

(4) cyano;

(5) trifluoromethyl;

(6) hydroxyl;

(7) alkyl of from one to six carbon atoms;

(8) alkoxyl of from one to six carbon atoms;

(9) alkanoyl of from one to six carbon atoms;

(10) —NR_6R_7, where R_6 and R_7 are independently

(a) hydrogen,

(b) alkyl of from one to six carbon atoms,

(c) alkanoyl of from one to six carbon atoms;

(11) —$COOR_8$ where R_8 is

(a) hydrogen,

(b) a pharmaceutically acceptable metal cation,

(c) a pharmaceutically acceptable amine cation,

(d) alkyl of from one to six carbon atoms;

(12) —$CONR_9R_{10}$ where R_9 and R_{10} are independently

(a) hydrogen,

(b) alkyl of from one to six carbon atoms,

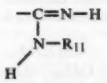
(c) alkyl of from one to six carbon atoms, substituted with one or two carboxyl groups,

(d) alkyl of from one to six carbon atoms, substituted with one to two carboxyl groups and one —OH, —SH, or —NH_2 group,

(e) alkyl of from one to six carbon atoms, substituted with one or two carboalkoxy groups of from one to six carbon atoms,

(f) alkyl of from one to six carbon atoms, substituted with one or two carboalkoxy groups of from one to six carbon atoms and one —OH, —SH, or —NH_2 group;

(13)



where R_{11} is hydrogen, or alkyl of from one to six carbon atoms; or

(14) —SO_2R_{12} where R_{12} is

(a) hydroxyl,

(b) alkyl of from one to six carbon atoms,

(c) alkoxy of from one to six carbon atoms, or

(d) —NHR_{13} where R_{13} is hydrogen or alkyl of from one to six carbon atoms;

and the pharmaceutically acceptable salts thereof.

31. A pharmaceutical composition comprising an antibacterially effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof in combination with a pharmaceutically acceptable carrier.

4,532,241

8,10-DIDEAZAMINOPTERINS

Joseph I. DeGraw, Sunnyvale, Calif.; Lawrence F. Kelly, Canberra, Australia, and Francis M. Sirotnak, Long Island, N.Y., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 411,658, Aug. 26, 1982, Pat. No. 4,460,591. This application Jan. 17, 1984, Ser. No. 571,505

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.³ C07D *471/04, 487/04;* **A61K** *31/505*

U.S. Cl. 514—258 . **3 Claims**

3. A method of inhibiting neoplastic growth in a living animal comprising administering a therapeutically effective amount of 10-ethyl-8,10-dideazaminopterin or a pharmaceutically acceptable salt thereof.

4,532,242

SUBSTITUTED TRIAZOLO[4,3-C]PYRIMIDINES

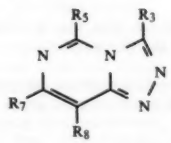
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed May 2, 1983, Ser. No. 490,842

Int. Cl.³ A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—258 **6 Claims**

1. A compound of the formula



wherein R_3 or lower alkyl; R_5 is hydrogen, lower alkyl, lower alkylthio or benzylthio; R_7 is hydrogen, lower alkyl, halogen, phenyl, N-(lower alkyl)amino, N,N-di(lower alkyl)amino, lower alkylthio or benzylthio; and R_8 is hydrogen, lower alkyl, halogen or phenyl; with the provisos that at least one of R_5 and R_7 is lower alkylthio or benzylthio, or R_7 is N-(lower alkyl-)amino or N,N-di(lower alkyl)amino; when R_5 is lower alkylthio, R_7 is halogen, phenyl or lower alkylthio, or R_8 is halogen or phenyl, or R_7 is halogen, phenyl or lower alkylthio and R_8 is halogen or phenyl; and when R_7 is phenyl, R_5 is benzylthio or lower alkylthio; or a pharmaceutically acceptable acid-addition salt thereof.

4. A bronchodilator pharmaceutical composition comprising an effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

5. A method for obtaining bronchodilation in a mammal,

comprising administering an effective amount of a compound according to claim 1 to said mammal.

4,532,243

IMIDAZO(1,2-A)PYRIMIDINES AND THEIR SALTS USEFUL FOR TREATING ANXIETY

Wilfred R. Tully, Cirencester, England, assignor to Roussel Uclaf, Paris, France

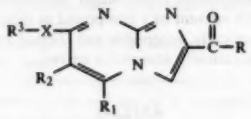
Filed Aug. 24, 1983, Ser. No. 526,046

Claims priority, application United Kingdom, Aug. 27, 1982, 8224606; Feb. 9, 1983, 8303612

Int. Cl.³ C07D *487/04;* A61K *31/505*

U.S. Cl. 514—258 **18 Claims**

1. A compound selected from the group consisting of imidazo[1,2-a]pyrimidines of the formula



wherein R is selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl, naphthyl, thienyl and pyridyl, each of said group optionally substituted with a member of the group consisting of halogen, alkyl of 1 to 5 carbon atoms, alkoxy and alkylthio of 1 to 5 carbon atoms, trifluoromethyl, amino, alkylamino of 1 to 5 alkyl carbon atoms and dialkylamino with alkyl of 1 to 5 carbon atoms, R_1 and R_2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, benzyl and phenethyl, each of said groups being optionally substituted with a member of the group consisting of halogen, alkyl of 1 to 5 carbon atoms, alkoxy and alkylthio of 1 to 5 carbon atoms, trifluoromethyl, amino, alkylamino of 1 to 5 carbon atoms and dialkylamino with alkyls of 1 to 5 carbon atoms, X is selected from the group consisting of oxygen and sulfur and R_3 is alkyl of 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,532,244

METHOD OF TREATING MIGRAINE HEADACHES

Margaret N. Innes, 5558 SW. Anhinga Ave., Palm City, Fla. 33490

Filed Sep. 6, 1984, Ser. No. 647,686

Int. Cl.³ A61K *31/46*

U.S. Cl. 514—291 **6 Claims**

1. A method for treating migraine comprising administering to a person suffering therefrom a symptom-alleviating amount of scopolamine or a pharmaceutically acceptable salt thereof and continuing said administration until the symptoms are alleviated.

4,532,245

PHARMACEUTICAL COMPOSITIONS

Ivan Kompis, Oberwil, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 243,151, Mar. 12, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,842

Claims priority, application Switzerland, Mar. 25, 1980, 2328/80

Int. Cl.³ A61K *31/625*

U.S. Cl. 514—275 **1 Claim**

1. An aqueous pharmaceutical composition, suitable for injection use, which comprises a reaction product formed from a water-soluble antibacterial sulfonamide salt selected from the group consisting of sulfadiazine, sulfamethoxazole, sulfatroxazole, sulfamerazine, sulfadoxine, sulfadimethoxine, sulfamethazine, sulfapyrazole, sulfaquinoxaline, sulfachloropyridazine, sulfaguanidine, sulfalene, sulfametin, sulfamethoxine, sulfamethoxy-pyridazine, sulfamethylphenazole, sulfaphenazole, sulfamoxole, sulfapyrazine, sulfapyridazine, sulfapyridine, sulfasymazine, sulfathiozole and sulfametrole, a sulfonamide-potentiator selected from the group consisting of substituted 2,4-diamino-5-benzyl-pyrimidine derivatives and formaldehyde, wherein the molar ratio of sulfonamide to sulfonamide-potentiator is equal to or greater than 1 to 1 and the mole ratio of sulfonamide-potentiator to formaldehyde is equal to or less than 1 to 1, and wherein said reaction product is obtained by mixing an aqueous solution of the sulfonamide salt, the sulfonamide-potentiator and aqueous formaldehyde and warming the mixture until complete solution occurs.

4,532,246

2-(2-PYRIDYLAMINOALKYLAMINO)-4-PYRIMIDONES

Robert J. Ife, Stevenage, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

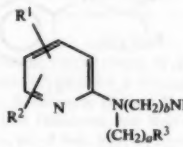
Filed Dec. 20, 1983, Ser. No. 563,496

Claims priority, application United Kingdom, Dec. 23, 1982, 8236637; Aug. 19, 1983, 8322349

Int. Cl.³ A61K *31/505, 31/44;* C07D *239/02*

U.S. Cl. 514—275 **8 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where

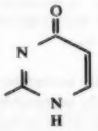
R^1 and R^2 are the same or different and are hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halogen;

R^3 is optionally substituted phenyl or optionally substituted pyridyl, where the optional substituent is one C_{1-6} alkyl, C_{1-6} alkoxy, or hydroxy group or halogen atom; or optionally substituted thiazolyl, optionally substituted furanyl or optionally substituted thienyl where the optional substituent is one C_{1-6} alkyl or C_{1-6} alkoxy group or halogen atom;

a is from 1 to 6

b is from 2 to 4

and R^4 is a group of formula (2):



(2)

8. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,532,247

5-(HYDROXYALKYL OR ALKANOYLOXYMETHYL)-1,6-NAPHTHYRIDIN-2(1H)-ONE AND CARDIOTONIC USE THEREOF

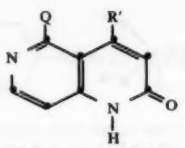
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,293

Int. Cl.³ A61K *31/44;* C07D *471/04*

U.S. Cl. 514—299 **7 Claims**

1. A 4-R'-5-Q-1,6-naphthyridin-2(1H)-one having the formula



or acid-addition salt thereof, where R′ is hydrogen or methyl, and Q is hydroxymethyl, 1-hydroxyethyl, alkanoyloxymethyl or 1-alkanoyloxyethyl, alkanoyl in each instance having from one to eight carbon atoms.

7. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or partenterally in a solid or liquid dosage form to such patient a cardiotonically effective amount of 4-R′-5-Q-1,6-naphthyridin-2(1H)-one according to claim 1 where Q is hydroxymethyl, 1-hydroxyethyl or alkanoyloxymethyl or pharmaceutically acceptable acid-addition salt thereof, alkanoyl having from one to eight carbon atoms.

4,532,248
METHOD OF COMBATTING CORONARY AND VASCULAR DISEASES

Gerhard Franckowiak, Wuppertal; Horst Böshagen, Haan; Friedrich Bossert, Wuppertal; Siegfried Goldmann, Wuppertal; Horst Meyer, Wuppertal; Egbert Wehinger, Wuppertal; Jürgen Stoltefuss, Haan; Matthias Schramm, Cologne; Günter Thomas, Wuppertal, all of Fed. Rep. of Germany, and Robertson Towart, Slough, England, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

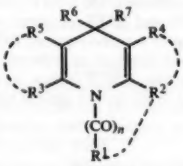
Filed Jul. 14, 1982, Ser. No. 398,034

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130041; Feb. 25, 1982, 3206671

Int. Cl.³ A61K *31/44*

U.S. Cl. 514—302 **13 Claims**

1. A method for augmenting contractility of the heart or for the treatment of hypotonic circulatory conditions, for the depression of the blood sugar, for decreasing the swelling of mucous membranes or for influencing the salt and fluid balance, in human and non-human animals, which comprises administering to the animals an effective amoung of a 1,4-dihydropyridine which exhibits positive inotropic activity and is of the formula



in the form of an individual isomer, an isomer mixture, a racemate or an optical antipode, or a pharmaceutically acceptable salt thereof, in which

n is 0, 1 or 2,

R^1

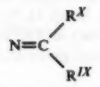
(a) represents a hydrogen atom, a straight-chain, branched, cyclic, saturated or unsaturated aliphatic hydrocarbon radical which has up to 10 carbon atoms and optionally contains 1 or 2 identical or different hetero chain members selected from O, CO, S, SO_2, =N— or NR^I, this hydrocarbon radical being optionally substituted by halogen, NO_2, CN, N_3, hydroxyl, phenyl, naphthyl or heteroaryl, or

(b) represents a phenyl, naphthyl or heteroaryl radical, these radicals optionally carrying 1 to 3 identical or different substituents selected from phenyl; alkyl, alkenyl, alkinyl, alkenoxy, and alkinoxy, each having up to 4 carbon atoms; aralkyl having 7 to 14 carbon atoms; acyl having up to 6 carbon atoms; alkylene; dioxyalkylene having up to 4 carbon atoms in the alkylene chain; halogen; CF_3; OCF_3, SCF_3; NO_2; CN; N_3; COR^{IV}; $COOR^V$; OR^{VI}; NR^I and $NR^{VII}R^{VIII}$; and it being possible for the alkyl, alkoxy and aryl radicals of the above-mentioned substituents to be substituted in turn by halogen, $COOR^V$ or $NR^{VII}R^{VIII}$, or

(c) represents a radical of the formula $NR^{VII}R^I$, (the radicals R^I, R^{II}, R^{IV}, R^V, R^{VI}, R^{VII} and R^{VIII} mentioned under (a), (b) and (c), immediately above having the meanings given below), R^2

(a), independently of R^1, has any of these meanings given immediately above for R^1, or

(b) represents a radical of the formula NHR^I or



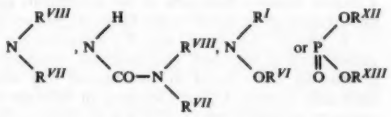
(R^I, R^{IX} and R^X having the meanings give below), or

R^1 and R^2 together form a 5-membered to 7-membered saturated or unsaturated ring which optionally contains one or two identical or different ring members selected from O, S, NR^I and CO, and which optionally contains one to three identical or different substituents selected from halogen; hydroxyl; alkyl and alkoxy, each having 1 to 4 carbon atoms; phenyl; naphthyl; and aralkyl having 7 to 14 carbon atoms,

R^3, independently of R^2 has any of those meanings given immediately above for R^2, with the proviso that only one of the substituents R^2 or R^3 can represent alkoxy, alkylthio or NHR^I in each instance,

R^4 and R^5 are identical or different and each

(a) represents a hydrogen atom, NO_2, NO, CN, SO_m—R^{IX} (in which m is 0 or 2), a halogen atom,



(wherein R^I, R^{VI}, R^{VII}, R^{VIII}, R^{IX} R^{XII} and R^{XIII} have the meanings given below), or

(b) represents a branched or unbranched cyclic, saturated or unsaturated aliphatic hydrocarbon radical which has up to 10 carbon atoms and is optionally substituted by halogen, OH, CN, alkoxy and alkylthio, each having 1 to 4 carbon atoms, phenyloxy, naphthoxy, $COOR^V$ or

(wherein R^V, R^{VII} and R^{VIII} have the meanings given below), or

(c) represents an aromatic hydrocarbon radical having 6 to 10 carbon atoms, or a 5-membered to 7-membered saturated or unsaturated hetero ring having 1 to 3 identical or different hetero members selected from O, S, —N=, NR^I (R^I having the meaning given below), and this hetero ring is linked to the dihydropyridine ring either via a carbon atom or a nitrogen atom, and the aromatic hydrocarbon radical and hetero rings optionally carry 1 to 3 identical or different substituents selected from halogen; OH; CN; CF_3; OCF_3, SCF_3; NO_2;

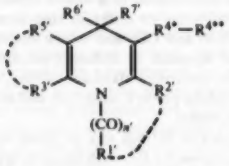
alkyl and alkoxy, each having 1 to 4 carbon atoms; phenyl; naphthyl; and

(R^{VII} and R^{VIII} having the meanings given below),

(d) represents a radical of the general formula

wherein X denotes oxygen, sulphur or NR^{I}, and Y represents a single bond, O, S or NR^{I} (R^{I} having the meaning given below), and R^8 independently of R^1, has any of those meanings given immediately above for R^1, or

(e) represents a radical of the formula.



wherein n', $R^{1'}$, $R^{2'}$, $R^{3'}$, $R^{5'}$, $R^{6'}$ and $R^{7'}$, independently of n, R^1, R^2, R^3, R^5, R^6, and R^7, have any of those meanings respectively given immediately above for n, R^1, R^2, R^3, R^5, R^6, and R^7, and

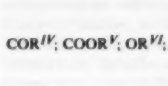
R^{4*} and R^{4**} are identical or different and each represents a radical, minus a hydrogen, of the substituents given immediately above for R^4 under (a) to (d), or each pair of, R^2 and R^4, and/or R^3 and R^5, independently together form a branched, straight-chain, saturated or unsaturated 5-membered to 7-membered ring which optionally contains 1, 2 or 3 identical or different ring members selected from O, CO, CS, C=NR^{I}, =N—, NR^{I} and SO_m (in which m is 0 or 2), and which is optionally substituted by halogen, hydroxyl, alkoxy having 1 to 4 carbon atoms, phenyl, naphthyl, aralkyl having 7 to 14 carbon atoms,

or is disubstituted by a straight-chain or branched alkylene chain having 3 to 8 carbon atoms, it also being possible for this common ring of R^2 and R^4 to be directly fused with the common ring of R^1 and R^2, (the radicals R^{I}, R^{II}, R^{III}, R^{VII} and R^{VIII} having the meanings give below),

R^6 represents a hydrogen atom or an alkyl or halogenoalkyl radical each having 1 to 4 carbon atoms, and R^7

(a) represents a saturated, unsaturated cyclic, straight-chain or branched aliphatic hydrocarbon radical which has up to 10 carbon atoms and is optionally substituted by halogen, phenyl, naphthyl or heteroaryl, or

(b) represents a phenyl, naphthyl or heteroaryl radical which optionally contains 1 to 3 identical or different substituents selected from NO_2; halogen; CN; N_3; NO; CF_3;



COR^{IV}; $COOR^{V}$; OR^{VI};

;

SO_mR^{XI} (in which m is 0, 1 or 2);

;

alkyl having 1 to 4 carbon atoms, phenyl; naphthyl; alkenyl, alkinyl, alkenoxy, and alkinoxy, each having up to 4 carbon atoms; aralkyl having 7 to 14 carbon atoms; acyl having 1 to 4 carbon atoms; alkylene or dioxyalkylene, each having up to 4 carbon atoms; and the above-mentioned alkyl and aryl substituents in turn can be substituted by halogen, $COOR^{V}$ or

and, in the above-mentioned definitions of the substituents R^1 to R^7,

R^{I} represents a hydrogen atom, an alkyl radical having 1 to 6 carbon atoms, a phenyl or naphthyl radical, an aralkyl radical having 7 to 12 carbon atoms, a heteroaryl radical or an acyl radical having up to 7 carbon atoms, R^{II} and R^{III} are identical or different and each represents an alkyl radical having 1 to 6 carbon atoms, a phenyl radical, a naphthyl radical, an aralkyl radical having 7 to 12 carbon atoms or a heteroaryl radical,

R^{IV}, R^{V} and R^{VI} are each identical or different and represent a hydrogen atom, an alkyl radical having 1 to 6 carbon atoms, a phenyl or naphthyl radical, an aralkyl radical having 7 to 12 carbon atoms or a heteroaryl radical,

R^{VII} and R^{VIII} are each identical or different and represent a hydrogen atom, a phenyl or naphthyl radical an aralkyl radical having 7 to 12 carbon atoms, or an alkyl radical which has 1 to 6 carbon atoms and which is optionally interrupted by O, S or NR^{I}, or R^{VII} and R^{VIII}, together with the nitrogen atom, form a 5-membered to 7-membered ring which can contain 1 or 2 identical or different hetero ring members selected from O, S or NR^{I}, or one of the radicals R^{VII} and R^{VIII} represents an aliphatic acyl group having up to 6 carbon atoms, R^{IX}, R^{X}, R^{XI}, R^{XII}, and R^{XIII} are each identical or different and represent an alkyl radical having 1 to 6 carbon atoms, a phenyl or naphthyl radical or an aralkyl radical having 7 to 12 carbon atoms.

4,532,249

DERIVATIVES OF P-ACYLAMINOPHENOL HAVING A THERAPEUTIC ACTION, AND COMPOSITIONS HAVING A THERAPEUTIC ACTION CONTAINING SAID DERIVATIVES AS PHARMACOLOGICALLY ACTIVE INGREDIENTS

Francois Molnar, Chalet Pilouhé1936 Verbier; Suzanne Szabo, Avenue de Sully, 1, 1814 La Tour-de-Peilz; Peter R. Statkov, 6 rue du Roveray, 1207 Geneva, all of Switzerland; Manuel Armijo, Mateo Inurria 30, Madrid 16, Spain; Carlos Sunkel, Mateo Inurria 30, Madrid 16, Spain, and Fernando Cillero, Mateo Inurria 30, Madrid 16, Spain

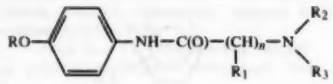
Filed Oct. 28, 1982, Ser. No. 437,318

Claims priority, application Switzerland, Nov. 2, 1981, 7000/81; Apr. 26, 1982, 2507/82

Int. Cl.[3] **C07D** *295/12, 295/14;* **A61K** *31/535*

U.S. Cl. 514—324 **4 Claims**

1. A compound having the formula



in which R represents an acyl radical derived from an organic acid chosen from the following acids: 1,(4-chlorobenzoyl)-5-methoxy-2-methyl-3-indolylacetic, and 2-(p-isobutylphenyl)-propionic, wherein n is equal to 1;

R_1 represents a hydrogen atom or a methyl group;

R_2 and R_3, are identical, each represents an ethyl group, and their salts with pharmaceutically acceptable acids.

2. Composition having a therapeutic action, characterized in that it contains, as a pharmacologically active ingredient an analgesic antiinflammatory, antiarthritic and antipyretic, compound of Formula I as defined in claim 1 and an effective amount of a carrier, excipient or inert diluent.

4,532,250

5-HETEROARYLIMIDAZOL-2-ONES HAVING CARDIOTONIC ACTIVITY

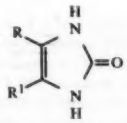
David M. Stout, Vernon Hills, and Diane M. Yamamoto, Gurnee, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 23, 1983, Ser. No. 554,498

Int. Cl.³ A61K *31/44*

U.S. Cl. 514—341 **3 Claims**

1. A method of treating or relieving the symptoms associated with cardiac insufficiency in a patient by a selective increase in the cardiac contractile force comprising administering to a patient in need of such a treatment a therapeutically effective amount of a compound of the formula



wherein R is pyridyl and R_1 is hydrogen or loweralkyl, or a pharmaceutically acceptable salt thereof.

4,532,251

N-SUBSTITUTED-N',N'-DISUBSTITUTED GLYCINAMIDE FUNGICIDES

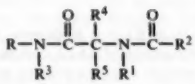
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 3, 1982, Ser. No. 446,802

Int. Cl.³ A01N *43/36, 43/38*

U.S. Cl. 514—354 **8 Claims**

1. A fungicidal composition comprising a biologically inert carrier and a fungicidally effective amount of a compound of the formula



wherein R is dihalophenyl or trihalophenyl, R^1 is lower alkyl, R^2 is a 5- or 6-member aromatic heterocyclic ring containing one ring nitrogen and the remainder of the ring atoms carbon atoms, with the proviso that a nitrogen of the heterocyclic ring is not bonded to the

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4,532,252

3,5-SUBSTITUTED-2-PYRIDYLALKYLAMINO COMPOUNDS HAVING HISTAMINE H_1-ANTAGONIST ACTIVITY

George S. Sach, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

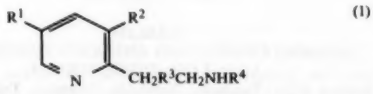
Filed Dec. 9, 1983, Ser. No. 559,520

Claims priority, application United Kingdom, Dec. 14, 1982, 8235590; Aug. 19, 1983, 8322347

Int. Cl.³ A61K *31/435, 31/44, 31/505;* **C07D** *213/36*

U.S. Cl. 514—357 **13 Claims**

1. A compound of formula (1)



(1)

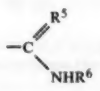
or a pharmaceutically acceptable salt thereof; where

R^1 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino or C_{1-4} alkyl;

R^2 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkyl, or C_{3-4} alkoxy;

R^3 is a C_{1-3} alkylene group; and

R^4 is a group of formula (2):



(2)

where

R^5 is NCN, NNO_2, NH or $CHNO_2$ and R^6 is hydroxy, amino, C_{1-6} alkyl, optionally substituted phenyl- or pyridyl(C_{1-6})alkyl (the optional substituents being one or more C_{1-6} alkyl, or C_{1-6} alkoxy groups or halogen atoms or a methylenedioxy group); or C_{2-4} alkynyl.

4,532,253

OXAPROZIN CALCIUM SALT PHARMACEUTICAL COMPOSITIONS

Ahmed S. Mughal, High Wycombe, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 371,904, Apr. 26, 1982, Pat. No. 4,465,838. This application Jul. 11, 1984, Ser. No. 629,704

Claims priority, application United Kingdom, Apr. 28, 1981, 8113074

Int. Cl.³ A61K *31/42*

U.S. Cl. 514—374 **16 Claims**

1. A pharmaceutical formulation comprising as active ingredient calcium oxaprozin and a pharmaceutically acceptable carrier.

4,532,254

INHIBITOR OF ALDOSE REDUCTASE

Jun Okuda; Ichitomo Miwa, both of Nagoya; Kazuhiro Inagaki, Okazaki; Tokunaru Horie, Tokushima, and Mitsuru Nakayama, Hiroshima, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

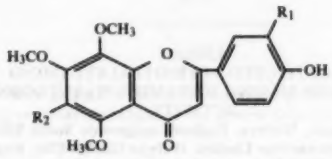
Filed Mar. 17, 1983, Ser. No. 476,153

Int. Cl.³ A61K *31/35*

U.S. Cl. 514—456 **2 Claims**

1. A pharmaceutical composition having an inhibitory activ-

ity against aldose reductase which comprises, as the effective ingredient, a flavone derivative having the following formula (II):



(II)

wherein R_1 is a hydrogen atom or a hydroxyl group, R_2 is a hydroxyl group or a methoxyl group or a pharmaceutically acceptable salt of said flavone derivative, with the proviso that when R_1 is hydrogen, R_2 is not a methoxyl group, and a pharmaceutically acceptable carrier.

4,532,255

AMIDINE COMPOUNDS AND ANTICOMPLEMENT AGENT COMPRISING SAME

Setsuro Fujii, Toyonaka; Toshiyuki Okutome, Tokyo; Toyoo Nakayama; Takashi Yaegashi, both of Funabashi, and Masateru Kurumi, Narita, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 300,534, Sep. 9, 1981, Pat. No. 4,454,338. This application Jan. 20, 1984, Ser. No. 572,269

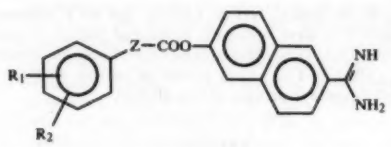
Claims priority, application Japan, Sep. 16, 1980, 55-128269; Apr. 28, 1981, 56-64942

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[3] **C07C** *101/00, 101/48;* **A61K** *31/34*

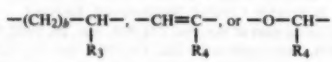
U.S. Cl. 514—466 **18 Claims**

1. An amidine derivative and a pharmaceutically acceptable acid addition salt thereof, said amidine derivative being represented by the formula (I)

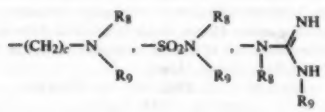


(I)

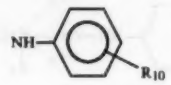
wherein Z represents $-(CH_2)_a-$,



(where a is 0, 1, 2 or 3, b is 0, 1 or 2, R_3 is a straight or branched chain alkyl group of 1 to 4 carbon atoms or a cycloalkyl group of 3 to 6 carbon atoms, and R_4 is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms) and R_1 and R_2, which may be the same or different, represent each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, —O—R_5, —S—R_5, —$COOR_5$, —COR_6, —O—COR_7, —$NHCOR_7$,

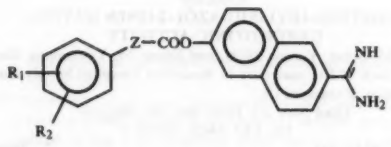


NO_2, CN, halogen, CF_3, methylenedioxy, or



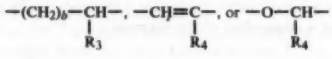
(where c is 0, 1 or 2; R_5 is a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, or benzyl group; R_6 is a hydrogen atom or straight or branched chain alkyl group of 1 to 4 carbon atoms; R_7 is a straight or branched chain alkyl group of 1 to 4 carbon atoms; R_8 and R_9, which may be the same or different, are each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, or amino radical protecting group; and R_{10} is a hydrogen atom, dimethyl or CF_3).

18. An anti-complement agent comprising as active ingredient an amidine derivative or a pharmaceutically acceptable acid addition salt thereof, said amidine derivative being represented by the formula

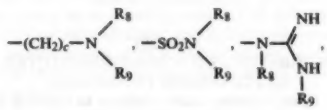


(I)

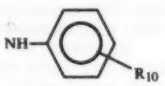
wherein Z represents $-(CH_2)_a-$,



(where a is 0, 1, 2 or 3, b is 0, 1 or 2, R_3 is a straight or branched chain alkyl group of 1 to 4 carbon atoms or a cycloalkyl group of 3 to 6 carbon atoms, and R_4 is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms) and R_1 and R_2, which may be the same or different, represent each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, —O—R_5, —S—R_5, —$COOR_5$, —COR_6, —O—COR_7, —$NHCOR_9$,



NO_2, CN, halogen, CF_3, methylenedioxy, or



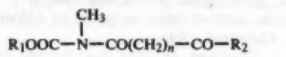
(where c is 0, 1 or 2; R_5 is a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, or benzyl group; R_6 is a hydrogen atom or straight or branched chain alkyl group of 1 to 4 carbon atoms; R_7 is a straight or branched chain alkyl group of 1 to 4 carbon atoms; R_8 and R_9, which may be the same or different, are each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms, or amino radical protecting group; and R_{10} is a hydrogen atom, dimethyl or CF_3).

4,532,256
PESTICIDAL N-METHYL-CARBAMIC ACID ESTERS

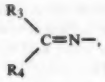
Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,655
Claims priority, application Switzerland, Dec. 24, 1982, 7534/82
Int. Cl.[3] A01N *47/10, 37/00, 43/08;* C07C *125/06*
U.S. Cl. 514—469 13 Claims

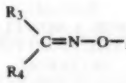
1. An N-methyl-carbamic acid ester of the formula



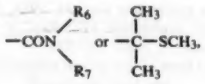
wherein
R_1 is



or is 2,3-dihydrobenzofuranyl, naphthyl or phenyl optionally substituted by halogen, C_1–C_6-alkoxy, C_1–C_6-alkylthio, amino, nitro, trifluoromethyl or C_1–C_6 alkyl,
R_2 is hydroxyl, halogen, —OR_1, C_1–C_{10}-alkoxy, C_2–C_{10}-alkenyloxy, di-(C_1–C_{10}-alkyl)-amino or



R_3 is hydrogen, C_1–C_6-alkyl or C_2–C_3-alkenyl,
R_4 is C_1–C_6alkyl, —SR_5



R_5 is C_1–C_6 alkyl or C_2–C_3-alkenyl,
R_6 and R_7 are each hydrogen or C_1–C_6-alkyl, and
n is zero or 1.

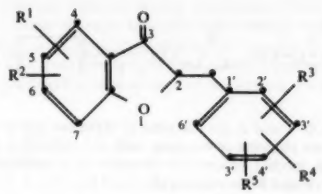
8. A method of combating insects acarids and nematodes on animals and plants as well as in the soil, which method comprises applying thereto or to the locus thereof a pesticidally effective amount of a compound according to claim 1.

4,532,257
CERTAIN AURONES AND THEIR USE IN THE TREATMENT OF ALLERGIES

Stephen R. Baker, Eversley, England; Terry D. Lindstrom, Indianapolis, Ind.; William B. Jamieson, Woking, and William J. Ross, Lightwater, both of England, assignors to Lilly Industries Limited, London, England

Filed Nov. 30, 1983, Ser. No. 556,473
Claims priority, application United Kingdom, Dec. 4, 1982, 8234671
Int. Cl.[3] A61K *31/34;* C07D *307/83*
U.S. Cl. 514—470 6 Claims

1. A compound of the formula



in which R^1 is carboxyl and R^2 is hydrogen, C_{3-4}alkenyl or C_{1-4}alkyl, and R^3, R^4 and R^5 are each hydrogen, nitro, hydroxyl, carboxyl, carboxyC_{1-2}alkoxy, C_{3-4}alkenyl, C_{1-4}alkyl, C_{3-4}alkoxy or the group

where R^6 and R^7 are each hydrogen or C_{1-4}alkyl; and pharmaceutically-acceptable acid addition salts and the C_{1-12}alkyl, 2-dimethylaminoethyl, 2-diethylaminoethyl or substituted methyl or ethyl esters thereof, where said substituents are members of the group acetoxy, methylthio, methoxy, ethoxy, methylsulfinyl and methylsulfonyl.

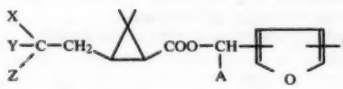
5. A method of treating a mammal including a human, suffering from an allergy disorder which comprises administering an effective amount of a compound according to claim 1.

4,532,258
CERTAIN CYCLOPROPANE CARBOXYLIC ACID ESTERS AND THEIR PESTICIDAL USE

Yoshiaki Omura, Okayama; Fumio Mori, Kurashiki; Yoshiji Fujita, Kurashiki; Takashi Nishida, Kurashiki; Takeo Hosogai, Kurashiki; Sukeji Aihara, Kurashiki; Yoshin Tamai, Kurashiki; Fumio Wada, Fukuoka, and Kazuo Itoi, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

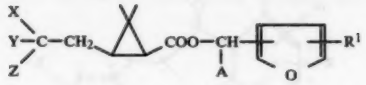
Division of Ser. No. 923,542, Jul. 11, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,179
Int. Cl.[3] A01N *53/00;* C07D *307/45*
U.S. Cl. 514—471 12 Claims

1. A method for the control of agricultural and horticultural insects, forest insects, harvested crop insects, household insects, mites, and pests of the genera Tettigoniidae, Gryllidae, Gryllotalpidae, Blattidae, Reduviidae, Pyrrhocoridae, Cimicidae, Delphacidae, Aphididae, Diaspididae, Pseudococcidae, Scarabaeidae, Dermestidae, Coccinellidae, Tenebrionidae, Chrysomelidae, Bruchidae, Tineidae, Noctuidae, Lymantriidae, Pyralidae, Culicidae, Tipulidae, Stomoxydae, Trypetidae, Muscidae, Calliphoridae, Pulicidae, Tetranychidae and Dermanyssidae, which comprises applying to the habitat of such pests a pesticidally effective amount of a cyclopropanecarboxylate having the formula:



wherein X, Y and Z are the same or different and at least two of same are chlorine or bromine, with the remaining one being hydrogen, methyl, chlorine or bromine; A is hydrogen, cyano or ethynyl; and R^1 is propargyl or benzyl.

10. A compound having the structural formula:



wherein X, Y and Z are the same or different and at least two of same are chlorine or bromine, with the remaining one being hydrogen, methyl, chlorine or bromine; A is hydrogen, cyano or ethynyl; and R^1 is propargyl.

4,532,259

BIS[(FLUORO- AND CHLORO-METHYLTHIO)FORMAMIDES], A PROCESS FOR THEIR PREPARATION AND THEIR USE

Helmut Ritter, Wuppertal; Wilfried Paulus, and Hermann Genth, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,588

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151445

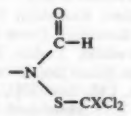
Int. Cl.³ A01N *37/18*; C07C *83/10*

U.S. Cl. 514—608 **19 Claims**

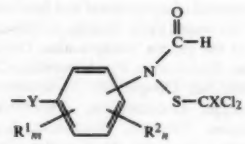
1. A bis[fluoro- or chloro-methylthio)formamide] of the formula

in which

A^1 and A^2 are identical or different and represent the radical



or the radical



wherein

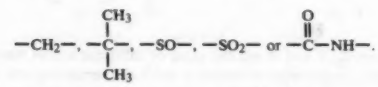
R^1 denotes an optionally halogenated lower alkyl or alkoxy radical or acetyl,

R^2 denotes fluorine, chlorine or nitrile,

m and m, independently of one another, represent one of the numbers 0, 1 or 2,

X denotes fluorine or chlorine and

Y represents a bridging member of the formula



18. A process for protecting an industrial material against attack by a fungus, bacteria or insect which comprises applying thereto an effective amount of the bis[(fluoro- or chloro-methylthio)formamide] of claim 1.

4,532,260

ELASTOMER COMPOSITIONS CONTAINING HUMATES

Harold R. MacKeighen, Akron, and Vincent T. Cortesi, Cuyahoga Falls, both of Ohio, assignors to Alfred D. Lobo Co., L.P.A., Cleveland, Ohio

Filed Oct. 18, 1984, Ser. No. 662,388

Int. Cl.³ C08J *9/08, 9/10*

U.S. Cl. 521—84.1 **15 Claims**

1. A method for producing sponge rubber comprising mixing humic acid humate with a vulcanizable rubber to form an essentially homogeneous mixture, and vulcanizing said rubber mixture at a temperature sufficient to cause said rubber mixture to expand into a cellular mass, said humic acid humate having a molecular weight of from about 2,000 to about 1,300,000 and having carbon content of from about 20 percent to about 60 percent.

4,532,261

FILLER SYSTEM FOR A NON-FLAMMABLE RIGID FOAM AND USE OF THE RIGID FOAM AS A BUILDING MATERIAL

Erich Rühl, Saalburgstrasse 65, 6382 Friedrichsdorf, and Johann Thenner, Pohlheim, both of Fed. Rep. of Germany, assignors to Erich Rühl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 636,233, Jul. 31, 1984, which is a division of Ser. No. 555,403, Nov. 28, 1983, Pat. No. 4,463,106. This application Oct. 31, 1984, Ser. No. 666,802

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244779; Mar. 1, 1984, 3407512

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—103 **17 Claims**

1. A non-flammable rigid foam on the basis of phenolic resin and furane resin, containing aluminum hydroxide and further components as a filler system, the weight ratio of resin substance : filler substance is at least 1:2.5 and up to 1:3.2 and the bulk density is from 50 kg/m³ to 450 kg/m³ and the resin compound is the reaction product obtained by the reaction with one another of

50–62 weight parts resolic resin

0–15 weight parts furanic resin

25–40 weight parts furfuryl alcohol

0.5–1.5 weight parts foam stabilizer

including 14–17 parts by weight per 100 parts by weight of resin component + filler substance of a curing agent mixture composed of

40–50 weight parts phosphoric acid

12–17 weight parts boron hydrofluoric acid

6–7 weight parts p-toluene sulfonic acid or p-phenol sulfonic acid and

32–35 weight parts water,

wherein the filler system is composed of:

40–50 weight parts aluminum hydroxide;

10–20 weight parts boric acid;

7–25 weight parts cryolite;

1–3 weight parts copper-II oxide; and

2–5 weight parts sodium tetraborate the ratio of borate: boric acid being 1:5 in said filler system.

4,532,262

PROCESS FOR THE PREPARATION OF URETHANE FOAM

Carl R. Gloskey, 42 Mooring Buoy, Hilton Head Island, S.C. 29928

Filed Mar. 21, 1984, Ser. No. 591,953
Int. Cl.[3] C08G *18/14, 18/24;* C01G *1/00*
U.S. Cl. 521—127 8 Claims

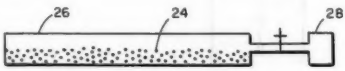
1. A process for the preparation of plastic polyurethane foam by the reaction of polyisocyanates and polyols in the presence of a catalyst and a foaming agent, utilizing as the catalyst a stannous carboxylate prepared from stannous chloride prepared with an excess of at least 10% tin at 95°–100° C. and thereafter reacting said stannous chloride with an alkali carboxylate and thereafter depolymerizing the resulting stannous carboxylate.

4,532,263

EXPANSIBLE POLYMER MOLDING PROCESS AND THE RESULTANT PRODUCT

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,643
Int. Cl.[3] B29D *27/00;* C08G *18/14*
U.S. Cl. 521—133 22 Claims



1. A process for forming a shaped polymer foam structure comprising:

(a) imbibing particles of a member selected from the group consisting of a polyetherimide, a polycarbonate and a polymer blend of polyphenylene oxide and polystyrene, with a solvent member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloethane and mixtures thereof,

(b) heating the imbibed particles to a temperature sufficient to cause expansion of said particles to a density significantly less than that of the imbibed particles; and

(c) filling a mold with the expanded particles and subjecting the particles to sufficient heat to fuse the particles together on cooling to form a shaped coherent foam structure.

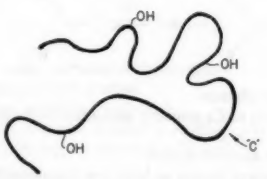
22. A shaped polyetherimide foam structure made by the process of claim 1.

4,532,264

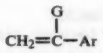
BETTER FOAMABLE STYRENE AND OTHER OLEFIN POLYMER COMPOSITIONS

Louis C. Rubens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 545,316, Oct. 24, 1983, , which is a division of Ser. No. 256,758, Apr. 23, 1981, Pat. No. 4,448,933. This application Apr. 27, 1984, Ser. No. 604,688
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—146 2 Claims



1. A lightly cross-linked expanded foam product of the composition comprising, in intimate admixture: (a) as a fundamental constituent, a hydroxylated, normally solid, linear polymer selected from the group consisting of linear olefin polymers, linear alkenyl aromatic copolymers, which is a polymerizate containing at least about 60 percent by weight, based on total polymer weight (i.e., "weight percent") of at least one polymerizable monomer of the general Formula:



wherein: G is selected from the group consisting of hydrogen and methyl; and Ar is an aromatic radical, including alkyl and halo-ring-substituted aromatic units, that contains from 6 to about 10 carbon atoms; with the balance being copolymerized units of another addition polymerizable monomer or monomer mixture that is copolymerizable with styrene, the copolymer having a hydroxyl functionality of from 2 to 6average hydroxyl groups per unit weight average molecule; and

(b) a substantially minor proportion of an inter-reactive crosslinking polyisocyanate constituent, with the further limitation that the copolymer have a crosslinking coefficient of from about 0.8 to about 3 which results in a visually detectable gel in a solvent which dissolves the corresponding noncrosslinked hydroxylated polymers, and that such composition on incorporation of a blowing agent therein is foamable to a thermal collapse resistant thermoplastic foam.

4,532,265

ALKENYL AROMATIC MONOMER OLEFINICALLY UNSATURATED ACID FOAMS AND METHOD FOR THE PREPARATION THEREOF

Chung P. Park, Pickerington, and Kyung W. Suh, Granville, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 490,106, Apr. 29, 1983, which is a continuation of Ser. No. 376,457, May 10, 1982, which is a continuation of Ser. No. 224,427, Feb. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 141,541, Apr. 18, 1980,. This application Mar. 12, 1984, Ser. No. 588,470
Int. Cl.[3] C08J *9/08*
U.S. Cl. 521—147 9 Claims

1. An improved alkenyl aromatic polymer foam, the foam having a density of from about 0.5 to 8 pounds per cubic foot, a cell size of from about 0.1 to 5 millimeters, the foam having a synthetic resinous thermoplastic body comprised of a polymer having a weight average molecular weight of from about 100,000 to about 350,000 gram moles, the polymer having polymerized therein from about 99 to 70 parts by weight of alkenyl aromatic monomer and from about 1 to 30 parts by weight of an olefinically unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid and mixtures thereof, the body defining a plurality of closed gas filled cells, the foam body having an ion therein, the ion being selected from a group consisting of sodium, magnesium, zinc, ammonium and mixtures thereof, wherein the foam was prepared by extrusion of heat plastified polymer containing as a blowing agent from about 0.5 to 20 parts by weight per 100 parts of polymer of a member selected from the group consisting of carbonates, carbonate hydrates and bicarbonates of sodium, magnesium, zinc, ammonium and mixtures thereof.

4,532,266

POLYMER-CONTAINING POLYETHER POLYAMINES AND A PROCESS FOR THE PRODUCTION OF THESE POLYAMINES

Werner Rasshofer, Cologne; Gerhard Ballé; Dieter Dieterich, both of Leverkusen, and Holger Meyborg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 360,037

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112118

Int. Cl.³ C07C *127/15, 127/24*

U.S. Cl. 521—159 13 Claims

1. A process for the production of a polyetherbased, urethane-group-containing polyamine which contains a polymer and/or copolymer of an unsaturated monomer comprising:

(a) converting a urethane-group-containing NCO-prepolymer of

(i) a difunctional or polyfunctional polyalkylene ether polyol having a molecular weight of from 1,000 to 10,000 which polyol contains from 1 to 60 wt. % of a grafted-on polymer and/or copolymer of an unsaturated monomer with

(ii) an excess molar quantity of an organic polyisocyanate into the corresponding carbamate in aqueous dispersion by reacting the prepolymer with an alkaline aqueous medium at a temperature of from 0° to 40° C. in a quantity such that the equivalent ratio of $OH^{\ominus}$ groups to NCO groups is greater than 1.01 to 1;

(b) converting the thus-produced carbamate into an amine by adding an equivalent or slightly greater than equivalent quantity of an acid ion exchanger; and

(c) separating the thus-produced urethane-group-containing polymer polyether polyamine from the reaction mixture.

4,532,267

VISION CORRFCTION LENS MADE FROM AN AMINOPOLYSACCHARIDE COMPOUND OR AN ETHER OR ESTER THEREOF

G. Graham Allan, Seattle, Wash., assignor to Board of Regents, University of Washington, Seattle, Wash.

Filed Feb. 15, 1984, Ser. No. 580,518

Int. Cl.³ C08L *5/08, 89/00;* G02C *7/04*

U.S. Cl. 523—106 33 Claims

1. An oxygen permeable, wettable, optically acceptable vision correction lens comprising a polymer consisting essentially of a homopolymer of an aminoglycan.

18. An oxygen permeable, wettable, optically acceptable wound healing lens comprising a polymer consisting essentially of a homopolymer of an aminoglycan.

4,532,268

IMIDAZOLE AGENT FOR RETARDING THE POLYMERIZATION OF AZIRIDINE COMPOUNDS

Peter Jochum, Seefeld; Heijo Hubner, Worthsee, and Oswald Gasser, Seefeld, all of Fed. Rep. of Germany, assignors to ESPE, Fabrik pharmazeutischer Praparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Dec. 1, 1983, Ser. No. 556,772

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1982, 3245052

Int. Cl.³ C08L *79/00, 79/02*

U.S. Cl. 523—109 19 Claims

1. A dental composition comprising at least one aziridine compound polymerizable with a sulfonium salt initiator and at least one imidazole compound dissolved directly in said aziridine compound or by action of a plasticizer.

4,532,269

ERODIBLE TERPOLYMER FROM TRIBUTYL TIN ACRYLATE OR METHACRYLATE AND PAINTS FOR FOULING CONTROL

Melvin H. Gitlitz, Edison; David B. Russell, Piscataway, and Howard H. Leiner, Cranbury, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Mar. 23, 1984, Ser. No. 592,635

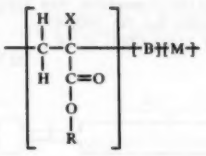
Int. Cl.³ C08L *33/08*

U.S. Cl. 523—122 8 Claims

1. An antifouling paint for protecting marine surfaces, comprising in combination:

(a) toxicant and

(b) a film-forming, water insoluble, seawater erodible polymeric binder having recurring groups represented by the formula



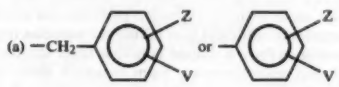
wherein

M is from greater than 2.5 to less than 25 mole percent of the unit from a tributyltin methacrylate or acrylate;

B is the unit from an ethylenically unsaturated monomer,

X is H or CH_3;

R is selected from the group consisting of:



wherein

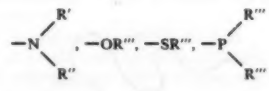
Z is NO_2, halogen or CN;

V is H, NO_2, halogen, CN or alkoxy;

(b) $-(CH_2)_nY$ wherein

n is an integer from 1 to 4; and

Y is selected from the group consisting of



and wherein

R′ is C_1 to C_4 primary, secondary or tertiary alkyl,

R″ is H or R′;

R‴ is alkyl or an aryl;

(c) haloalkyl having at least one trihalomethyl group, where the halogen is Br, F or Cl and the alkyl has at least two carbons;

(d) $-Si(R''')_3$ or $-Si(OR''')_3$, and R‴ is alkyl or an aryl.

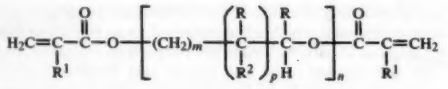
4,532,270

HIGH TEMPERATURE STABLE ADHESIVE COMPOSITIONS EMPLOYING AROMATIC POLYIMIDE AND POLYISOIMIDE BIS-ACETYLENE ADDITIVES

Robert D. Rossi, Levittown, Pa., and Dilip K. Ray-Chaudhuri, Bridgewater, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

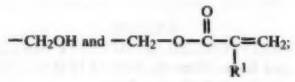
Filed Jan. 27, 1984, Ser. No. 574,448
Int. Cl.[3] C08K 5/34; C08F 238/00
U.S. Cl. 523—176 11 Claims

1. An anaerobic adhesive composition comprising a mixture of (A) an acrylic or substituted acrylic monomer selected from the group consisting of:



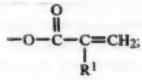
where

R is selected from the group consisting of hydrogen, methyl, ethyl,



R^1 is selected from the group consisting of hydrogen, chlorine, methyl and ethyl;

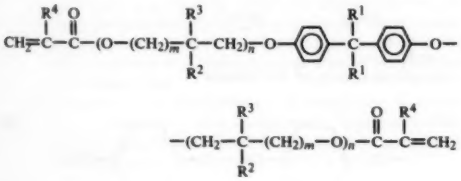
R^2 is selected from the group consisting of hydrogen, hydroxy, and



m is an integer from 1 to 8;

n is an integer from 1 to 20;

p is 0 or 1;



wherein

R^1 is methyl, ethyl, carboxyl or hydrogen;

R^2 is hydrogen, methyl of ethyl;

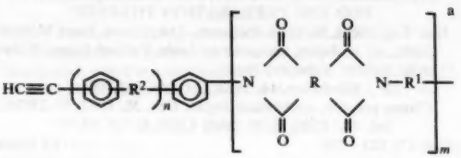
R^3 is hydrogen, methyl or hydroxyl;

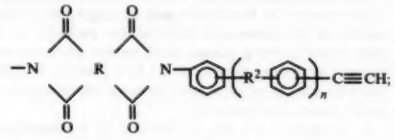
R^4 is hydrogen, chlorine, methyl or ethyl;

n is an integer having a value of 0 to 8; and

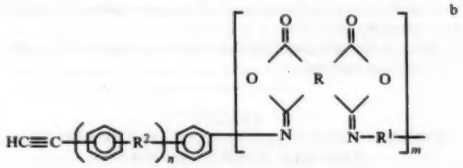
m is 0 or 1;

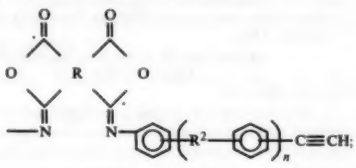
and mixtures thereof; and (B) about 1 to 50% by weight of the total composition of an additive selected from the group consisting of a polyimide having a structure





a polyisoimide having a structure

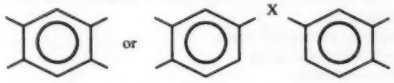




and mixtures thereof;

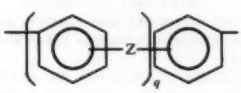
wherein

R is



with X being O, CH_2, S, CO, SO_2 CHOH, $-(CF_2)_p-$, $-CF_2-O-CF_2-$, $-C(CF_3)_2-$, or a bond;

R^1 is



with Z being O, CH_2, S, CO, SO_2 CHOH, $-(CF_2)_p-$, $-CF_2-O-CF_2-$, $-C(CF_3)_2-$, and q being 0–5;

R^2 is O, CH_2, S, CO, SO_2, $-(CF_2)_p-$, $-CF_2-O-CF_2-$, $-C(CF_3)_2-$, with p being 1–5;

n is 0 to 10; and

m is 0 or above; and

(C) about 0.1 to 10% by weight of the total composition of a free-radical polymerization initiator sufficient to initiate cure at room temperature in the absence of air or oxygen and on contact with a metal surface.

4,532,271
BITUMINOUS PAVING MATERIAL AND A METHOD FOR THE PREPARATION THEREOF

Isao Kai, Aichi; Sumiaki Ichikawa, Tokyo, and Yozo Mihara, Aichi, all of Japan, assignors to Asahi Yukizai Kogyo Kabushiki Kaisha, Nobeoka, Japan

Filed Nov. 14, 1983, Ser. No. 551,708
Claims priority, application Japan, Dec. 30, 1982, 57-228281
Int. Cl.³ C08K *3/36, 9/10;* **C08L** *61/06, 95/00*
U.S. Cl. 523—208 **11 Claims**

1. A bituminous paving material which comprises a bituminous material as the matrix and an aggregate uniformly dispersed in the bituminous material, the particles of the aggregate material being coated with molten phenolic resin in an amount in the range of from 0.1 to 3 parts by weight per 100 parts by weight of aggregate, prior to dispersing the particles in the bituminous material.

3. A method for the preparation of a bituminous paving material which comprises the steps of:

(a) blending 100 parts by weight of an aggregate and 0.1 to 3 parts by weight of a phenolic resin at a temperature higher than the melting point of the phenolic resin to uniformly coat the surfaces of the aggregate with molten phenolic resin, and

(b) then directly blending the coated aggregate with a bituminous material.

4,532,272
CREATION AND MAINTENANCE OF THE BED OF A PARTICLE FORM EVAPORATOR

Mason S. Wilt, Amarillo, Tex., and Richard E. Dietz, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1984, Ser. No. 625,750
Int. Cl.³ C08K *5/54*
U.S. Cl. 523—330 **18 Claims**

1. In a process for drying a polymer solution comprising polymer and solvent which comprises introducing the polymer solution into an agitated bed of polymer particles; wherein said agitated bed is mechanically agitated in a manner sufficient to cause evaporation of a substantial portion of said solvent, the improvement which comprises introducing an additive comprising at least one parting agent into said agitated bed; wherein said additive is introduced in an amount sufficient to reduce the buildup of polymers on the walls of said agitated bed; and wherein said parting agent is selected from the group consisting of:

aliphatic carboxylic acids,
aryl carboxylic acids,
fatty acid salts,
hydroxy end-blocked dihydrocarbyl silicone fluids,
carboxyalkysiloxanes, and
waxes.

4,532,273
TWO-PART ADHESIVE

Toshio Kadowaki, Amagasaki, and Koichiro Sanji, Takatsuki, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1984, Ser. No. 612,597
Claims priority, application Japan, Oct. 7, 1983, 58-188601
Int. Cl.³ C08L *93/00, 91/06;* **C08F** *267/10*
U.S. Cl. 523—402 **9 Claims**

1. A two-part adhesive which comprises

(i) as the main ingredient an emulsion consisting essentially of (a) an aqueous emulsion of a polymer or copolymer obtained from an essential monomer of an adduct of a tertiary amino group-containing acrylic or methacrylic acid ester and an epihalohydrin, (b) a tackifier resin selected from the group consisting of a petroleum hydrocarbon resin, a phenolic resin, a terpene resin, a rosin resin, a coumarone resin, and a coumarone-indene resin, and (c) an epoxy compound containing two or more epoxy groups in the molecule; and

(ii) a curing agent selected from a primary or secondary amino group-containing compound.

4,532,274
CURABLE EPOXY RESIN CONTAINING MOLDING COMPOSITIONS

Orson K. Spurr, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 430,364, Sep. 30, 1982, abandoned. This application Apr. 17, 1984, Ser. No. 600,222
Int. Cl.³ C08L *63/00*
U.S. Cl. 523—457 **13 Claims**

1. A curable molding composition comprising an epoxide resin, a polyol, a hardener, and a catalyst selected from the group consisting of amine, quaternary ammonium or phosphonium compounds which when combined, in an amount of from 0.5 to about 10 parts by weight per 100 parts by weight of resin, with said epoxide resin, said polyol, said hardener, and 60 percent by weight, based on the total weight of the formulation, of aluminum trihydrate produce a composition characterized by a peak exotherm of 210° C. or less, a time to peak exotherm of 10.5 or less minutes in a mold at 150° C., and a time for the viscosity of the composition to reach 3000 centipoise at 80° C. of 30 minutes or greater.

4,532,275
FIBER-REINFORCED COMPOSITE MATERIALS

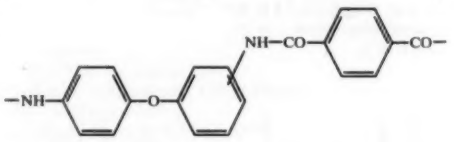
Yuzo Aito, and Keizo Shimada, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 29, 1982, Ser. No. 343,978
Claims priority, application Japan, Feb. 3, 1981, 56-13735; Jun. 8, 1981, 56-86819; Nov. 26, 1981, 56-188305
Int. Cl.³ C08K *3/04*
U.S. Cl. 523—468 **19 Claims**

1. A fiber-reinforced composite material comprising a resin and 20 to 90% by weight, based on the composite material, of reinforcing fibers, said reinforcing fibers comprising fibers of a wholly aromatic polyamide consisting essentially of

(1) structural units of the formula

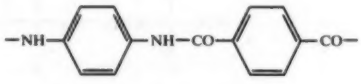
(A)



and

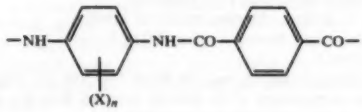
(2) structural units of the formula

(B)



and/or structural units of the formula

(C)



wherein X represents a halogen atom and n is an integer of from 1 to 3.

4,532,276

WRITING FLUID

Thomas Knäble, Steinthalstr. 21, 8500 Nürnberg; Lydia Söllner, Lindenstr. 8, 7981 Grünkraut; Richard Wethey, Kölner Strasse 20, 8500 Nürnberg, and Ilse Otte, Renzenhofer Strasse 18, 8505 Röthenbach, all of Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,454

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306786

Int. Cl.³ C09D *11/14, 11/04*

U.S. Cl. 524—18 **12 Claims**

1. In a writing or recording fluid on an aqueous basis such as an aqueous ink, wherein the fluid comprises coloring agent, binder, water and, optionally, other additives, the improvement which comprises that it contains as binder a polyurethane which, before it is mixed with other components, is in the form of an aqueous dispersion and wherein the coloring agent comprises pigments which, before they are mixed with the other components, are present as a pigment dispersion or pigment paste.

4,532,277

HYDROPHILIZED CELLULOSE ESTERS, PROCESS FOR THEIR PREPARATION, THEIR USE AS BIOMEDICAL MATERIALS AND CONTACT LENSES PRODUCED FROM THESE

Frank Wingler, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,589

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300345

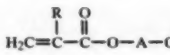
Int. Cl.³ C08L *1/10, 23/08, 31/04;* A61F *1/00*

U.S. Cl. 524—37 **16 Claims**

1. A polymer blend comprising 98–80% by weight of component A and 2–20% by weight of component B wherein:

component A is a cellulose ester of an aliphatic carboxylic acid with up to 40% by weight of total component A of an ethylene/vinyl acetate copolymer having 30–98% by weight, relative to ethylene/vinyl acetate, of incorporated vinyl acetate and

component B is a homopolymer or copolymer of acrylic acid, methacrylic acid, acrylamide, methacrylamide, diacetone-acrylamide, vinyl pyrrolidone, or compounds of the formula



wherein

R is H or CH_3,

R' is H, CH_3 or C_2H_5 and

A is a straight-chain or branched alkylene moiety having 1 to 4 carbon atoms; and up to 10% by weight relative to the total polymer B of multifunctional crosslinker vinyl compounds.

4,532,278

FIRE RETARDANT POLYOLEFIN FIBERS AND FABRICS

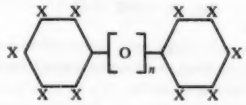
Henry Hancock, 9 Decker Ter., Kinnelon, N.J. 07403

Continuation-in-part of Ser. No. 551,517, Nov. 16, 1983, abandoned, which is a continuation of Ser. No. 201,338, Oct. 27, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,346

Int. Cl.³ C08K *5/03, 5/34*

U.S. Cl. 524—101 **11 Claims**

1. An extruded polyolefin fiber comprising a polyolefin, a compound having the following formula:



(I)

wherein n is 0 or 1; X is bromine, hydrogen, hydroxyl, or alkyl; and wherein the alkyl portion of these groups may contain hydroxyl and/or oxygen; and wherein the alkyl is a lower alkyl (C_1–C_4), and wherein there is at least one bromine for each phenyl radical, and a -3,5-alkylsubstituted(hydroxybenzyl-)isocyanurate, wherein said fiber is flame retardant and substantially water white.

4,532,279

POLYALKYLPIPERIDINE ESTERS OF ALIPHATIC TETRACARBOXYLIC ACIDS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

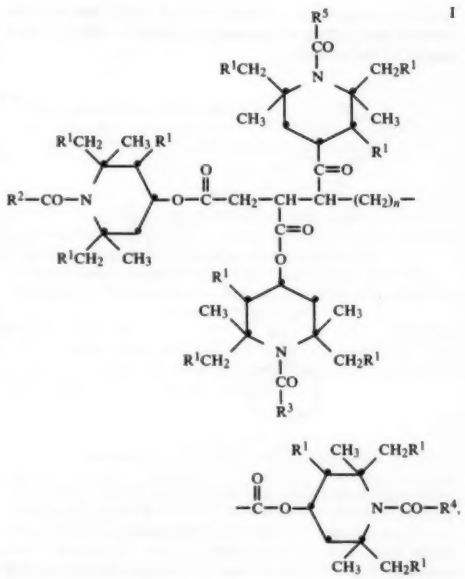
Filed Jan. 19, 1984, Ser. No. 571,980

Claims priority, application Switzerland, Jan. 31, 1983, 535/83

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—102 **6 Claims**

1. A compound of the formula I



I

wherein n is 0 or 1, R^1 is hydrogen or C_1–C_4alkyl, and R^2, R^3,

R^4 and R^5 are each independently hydrogen, C_1–C_{17}alkyl, C_2–C_{17}alkenyl, C_5–C_8cycloalkyl, C_5–C_8cycloalkylalkyl or C_5–C_8alkylcycloalkyl, C_6–C_{10}aryl, C_7–C_{16}alkylphenyl, C_7–C_{12}aralkyl or C_8–C_{13}alkylphenylalkyl.

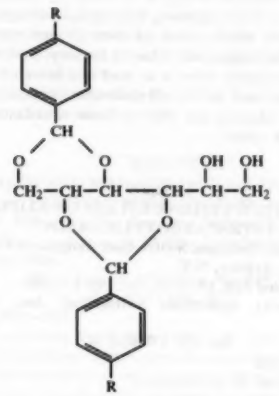
4,532,280

CRYSTALLINE POLYOLEFIN-TYPE RESIN COMPOSITIONS

Toshiaki Kobayashi, Nara, and Masafumi Yoshimura, Kyoto, both of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan

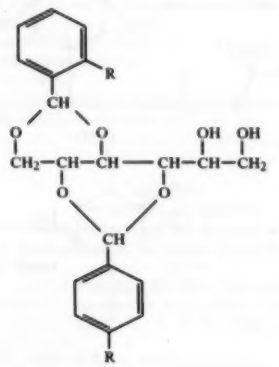
Filed Jun. 11, 1984, Ser. No. 619,460
Int. Cl.³ C08K 5/15
U.S. Cl. 524—108 **5 Claims**

1. A crystalline polyolefin resin composition comprising a crystalline polyolefin resin, a di(p-substituted benzylidene)sorbitol represented by the formula



(I)

wherein R represents a methyl or ethyl group, and an o-substituted benzylidene-p-substituted benzylidene sorbitol represented by the formula



(II)

wherein R is as defined above, the total amount of the compounds of the formulae (I) and (II) being about 0.08 to about 1 part by weight per 100 parts by weight of the crystalline polyolefin resin, and the proportions of the compounds of the formulae (I) and (II) being about 0.5 to about 8 parts by weight of the compound of the formula (II) per 100 parts by weight of the compound of the formula (I).

4,532,281

MINERAL FILLED POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING POLYTETRAFLUOROETHYLENE RESIN

Gim F. Lee, Jr., Albany, and Robert A. Williams, Selkirk, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 347,077, Feb. 8, 1982, abandoned. This application Nov. 29, 1983, Ser. No. 556,014
Int. Cl.³ C08K 3/10, 3/00; C08L 71/04
U.S. Cl. 524—141 **12 Claims**

1. A thermoplastic composition, comprising an intimate admixture of

(a) a blend of a polyphenylene ether resin, an impact modifier and a mineral filler; and

(b) a notched Izod impact strength enhancing amount of a polytetrafluoroethylene resin.

4,532,282

BLENDS OF AROMATIC POLYCARBONATE RESIN, OLEFIN POLYMERS OR COPOLYMERS AND ACRYLATE- OR METHACRYLATE-COPOLYMER RESINS

Ping Y. Liu, Naperville, Ill., and David E. Overton, Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 16, 1983, Ser. No. 475,746
Int. Cl.³ C08K 5/42; C08L 69/00
U.S. Cl. 524—157 **16 Claims**

1. A thermoplastic composition, comprising an intimate blend of

(a) from about 55 to about 93 parts by weight of an aromatic polycarbonate resin;

(b) from about 3.5 to about 30 parts b weight of a polyolefin homopolymer an olefin copolymer or terpolymer made solely from olefin monomers or mixtures thereof; and

(c) from about 3.5 to about 15 parts by weight of a third polymeric component comprising a copolymer of one or more olefins and a monomeric acrylate, methacrylate, acrylic acid or methacrylic acid, the amount of (c) being at least sufficient to impart to the blend a resistance to impact failure in thick sections greater than that possessed by (a), and a weld line impact strength better than that possessed by (a) and (b) in combination the total weight of (a), (b), and (c) combined is 100 parts.

14. A composition according to claim 1, wherein a flame retardant effective amount of a metal salt of an organic sulfonic acid is also present.

4,532,283

AROMATIC CARBONATE POLYMER COMPOSITION

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Sep. 23, 1982, Ser. No. 421,787
Int. Cl.³ C08K 7/02, 5/42; C08L 53/02, 69/00
U.S. Cl. 524—166 **11 Claims**

1. A composition comprising a blend of

(a) an aromatic carbonate polymer resin derived from a carbonate precursor and a dihydric phenol, said dihydric phenol being unsubstituted on its aryl grouping or groupings and

(b) from about 10 to about 50 weight percent of coupled resinous block copolymer having blocks comprising polymerized vinyl aromatic units connected to blocks comprising polymerized diene units; the residual dienic unsaturation being essentially non-hydrogenated, and said 10 to about 50 weight percent of copolymer imparting to the blend a resistance to environmental stress cracking and crazing greater than that possessed by the said aromatic carbonate polymer, the amount of copolymer based upon the weight of copolymer and aromatic carbonate polymer.

4,532,284

CARBONATE POLYMER COMPOSITION

Samuel A. Ogoe, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 506,741, Jun. 22, 1983, abandoned. This application Jul. 6, 1984, Ser. No. 628,545

Int. Cl.³ C08K 5/43

U.S. Cl. 524—169 7 Claims

1. A flame retardant polymer composition comprising a carbonate polymer having dispersed therein a metal salt of an aromatic sulfimide and a metal sulfate or bisulfate having a pka from 1 to 5 inclusive whereby said sulfimide is used in an amount from 0.001 to about 10 weight percent to provide improved flame retardancy and the amount of said sulfate or bisulfate used is from 0.001 to 1.0 weight percent to provide increased processing stability all percentages being based on the weight of the carbonate polymer.

4,532,285

ORGANOCLAY ANTIOZONANT COMPLEX

Thomas D. Thompson, III, Upper Black Eddy, Pa., assignor to Georgia Kaolin Company, Inc., Union, N.J.

Continuation of Ser. No. 511,707, Jul. 7, 1983, abandoned. This application May 29, 1984, Ser. No. 614,697

Int. Cl.³ C08K 9/04, 5/18

U.S. Cl. 524—255 19 Claims

1. A method for preparing an organoclay-antiozonant complex functional as an additive to rubber for inhibiting ozone oxidation, comprising mixing a smectite-containing clay with a mixture consisting of a quaternary amine, a polar solvent, and an antiozonant consisting of dialkyl paraphenyldiamines, diaryl paraphenylenediamines, alkyl-aryl parapheylenediamines, or mixtures thereof, so as to form an expanded organoclay derivative of said smectite-containing clay and said quaternary amine, said antiozonant being complexed with said organoclay derivative.

14. A method of incorporating an antiozonant into natural or synthetic rubber formulations comprising:

a. forming an organoclay-antiozonant complex by mixing a smectite-containing clay with a mixture consisting of a quaternary amine, a polar solvent, and an antiozonant consisting of dialkyl paraphenylenediamines, diaryl paraphenylenediamines, alkyl-aryl paraphenylenediamines, or mixtures thereof so as to form an expanded organoclay derivative of said smectite-containing clay and said quaternary amine, said antiozonant being complexed with said organoclay derivative;

b. mixing said organoclay-antiozonant complex with a naphthenic oil and a polar solvent to form a paste; and

c. adding said organoclay-antiozonant-oil paste to the rubber formulation.

4,532,286

STABILIZED RUBBER OR LUBRICANT COMPOSITIONS CONTAINING MERCAPTOALKYL ESTERS OF HINDERED PHENOLS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 371,038, Apr. 23, 1982, abandoned, which is a continuation of Ser. No. 217,364, Dec. 17, 1980, abandoned, which is a division of Ser. No. 127,015, Mar. 4, 1980, abandoned. This application Nov. 3, 1983, Ser. No. 548,533

Claims priority, application Switzerland, Mar. 9, 1979, 2280/79; May 3, 1979, 4141/79

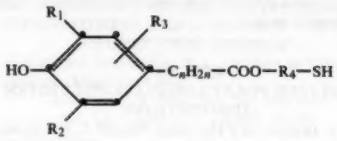
Int. Cl.³ C08K 5/37

U.S. Cl. 524—289 2 Claims

1. A stabilized composition which comprises

(a) a polymer selected from the group consisting of polybutadiene, nitrile rubber and copolymer of acrylonitrile/-butadiene/styrene (ABS), and

(b) from 0.01 to 5% by weight, based on the stabilized polymer, of a compound of formula I



(I)

wherein

R_1 and R_2 are alpha-branched alkyl of 3 to 8 carbon atoms, R_3 is hydrogen, R_4 is ethylene, 1,3-propylene or 1,4-butylene, and n is 2 or 4.

4,532,287

FLAMEPROOFING COMPOSITION FOR POLYPROPYLENE COMPRISING A HALOGENATED ALKYLARYL ETHER, AN ORGANO-TIN COMPOUND AND A STERICALLY HINDERED PHENOL OR BISPHENOL

Rudolf Bill, and Rainer Wolf, both of Allschwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 11, 1984, Ser. No. 609,483

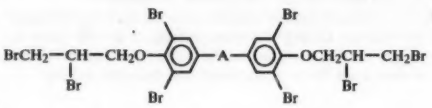
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317393

Int. Cl.³ C08L 55/02

U.S. Cl. 524—343 20 Claims

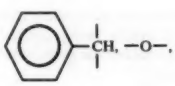
1. A flameproofing composition comprising:

(a) a compound of formula (Ia)



(Ia)

wherein A is a direct bond, C_{1-4}alkylene,



(b) an organo-tin compound; and

(c) a sterically hindered phenol or a bisphenol containing a sterically hindered —OH group on each phenyl.

4,532,288

POLY(ARYL ETHER) BLENDS

Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 363,100, Mar. 29, 1982, abandoned. This application Jun. 23, 1982, Ser. No. 391,382

Int. Cl.³ C08K 5/41

U.S. Cl. 524—375 19 Claims

1. A composition comprising a blend of a poly(aryl ether) polymer, a styrene and/or acrylic copolymer and a compatibilizing amount of a polyhydroxyether.

4,532,289

PRIMER COATING COMPOSITION

Mark F. Mosser, Sellersville, and William J. Fabiny, Harleysville, both of Pa., assignors to Sermatech International, Inc., Limerick, Pa.

Filed Nov. 28, 1983, Ser. No. 555,457

Int. Cl.³ C08K 3/10

U.S. Cl. 524—406 17 Claims

1. A primer coating composition, particularly for use with a polyvinylidene fluoride top coat, which comprises (a) phos-

phate ions and ions of the group of chromate ions or molybdate ions in an aqueous acid solution, and (b) particulate of polyvinylidene fluoride in (a).

4,532,290

STABILIZED POLYCARBONATE-POLYESTER COMPOSITIONS

Donald B. G. Jaquiss, New Harmony; Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed May 2, 1984, Ser. No. 606,353

Int. Cl.[3] C08K *3/32*; C08L *69/00*

U.S. Cl. 524—417 **15 Claims**

1. A thermoplastic composition comprising:

(a) 100 parts by weight of an aromatic polycarbonate resin;

(b) 5 to 95 parts by weight of at least one polyester resin prepared by reacting terephthalic acid or a reactive derivative thereof and an alkane diol; and

(c) a melt-stabilizing amount of monosodium phosphate, monopotassium phosphate or a mixture thereof.

4,532,291

BEAD FILLER RUBBER COMPOSITION

Junnosuke Hayashi; Teruo Tanibuchi, both of Ichihara, and Shinji Yamamoto, Yotsukaido, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed May 4, 1984, Ser. No. 606,971

Claims priority, application Japan, May 6, 1983, 58-78307

Int. Cl.[3] C08K *3/04*

U.S. Cl. 524—496 **4 Claims**

1. A bead filler rubber composition, comprising:

(A) a reinforced rubber composition comprising vulcanizable rubber having dispersed therein 5 to 100 parts by weight per 100 parts by weight of the vulcanizable rubber, of fine short fibers of thermoplastic polymer having

groups in the polymer molecule, said vulcanizable rubber and said thermoplastic polymer being grafted to each other through a phenol formaldehyde resin precondensate at an interface of the fiber;

(B) a diene rubber; and

(C) carbon black, wherein the following conditions (i) through (iv) are satisfied:

(i) the amount of said thermoplastic polymer is 2 to 20 parts by weight per 100 parts by weight of the total amount of the rubber constituents;

(ii) the ratio of the rubber is such that the total amount of natural rubber or polyisoprene in the component (A) and the component (B) is 100 to 55% by weight;

(iii) the amount of the carbon black is 50 to 70 parts by weight per 100 parts by weight of the total amount of the rubber constituents; and

(iv) the vulcanizable derived from the rubber composition has a 50% modulus of at least 30 kg/cm2.

4,532,292

AMINO RESIN DISPERSIONS

Peter Dörries, Frankfurt am Main, and Helmut Wahl, Düsseldorf, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main and Theodor Hymmen KG, Bielefeld, both of, Fed. Rep. of Germany

Continuation of Ser. No. 473,969, Mar. 10, 1983,. This application Jun. 25, 1984, Ser. No. 624,599

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208728

Int. Cl.[3] C08L *61/22*; C08K *3/20*

U.S. Cl. 524—598 **6 Claims**

1. Spreadable amino resin dispersion containing 70–90% by weight of a solid, modified melamine-formaldehyde resin having a melamine-formaldehyde ratio of from 1:1.5 to 1:2.2 and a water-dilutability within the range from 1:0.8 to 1:1.5 and 30–10% by weight of a liquid dispersant.

4,532,293

α-CYANOACRYLATE INSTANT ADHESIVE COMPOSITION CONTAINING BTDA OR BTA

Takayuki Ikeda, Shiga; Kazuo Kouhara, Moriyama, and Minoru Sasaki, Uji, all of Japan, assignors to Kabushiki Kaisha Alpha Giken, Osaka, Japan

PCT No. PCT/JP84/00033, § 371 Date Oct. 9, 1984, § 102(e) Date Oct. 9, 1984, PCT Pub. No. WO84/03097, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 4, 1984, Ser. No. 662,430

Claims priority, application Japan, Feb. 9, 1983, 58-21293

Int. Cl.[3] C09J *3/14*; C08F *22/32*

U.S. Cl. 524—754 **1 Claim**

1. α-cyanoacrylate instant adhesive compositions, characterized by that benzophenonetetracarboxylic acid or anhydride thereof is incorporated into α-cyanoacrylate.

4,532,294

SUPERIOR HIGH SOLIDS COATINGS

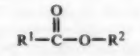
Constantine J. Bouboulis, Union, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1983, Ser. No. 558,953

Int. Cl.[3] C08F *2/06, 20/28*; C08K *5/10*

U.S. Cl. 524—773 **17 Claims**

1. An improved process for forming acrylic copolymer resins suitable for electrostatic spraying in high solids coatings containing at least 50 wt.% solids which comprises contacting under polymerizing conditions a polymerization mixture comprising at least one hydroxy-substituted alkyl(meth)acrylate monomer and at least one non-hydroxy substituted alkyl(meth)acrylate monomer in the presence of a free radical initiator and a solvent therefor, said solvent being employed in an amount of from about 10 to 70 wt.% of the polymerization mixture, and said solvent comprising at least one normally liquid ester selected from the group consisting of compounds having the formula:



wherein R^1 is a straight or branched chain alkyl of 1 to 6 carbon atoms, and R^2 is a straight or branched chain alkyl of 1 to 7 carbon atoms, with the proviso that R^1 and R^2 together contain from 6 to 11 carbon atoms, said hydroxy-substituted alkyl(meth)acrylate monomer comprising from about 5 to 30 wt.% of the total monomers charged to said polymerization reaction, and said non-hydroxy substituted alkyl(meth)acrylate monomer comprising from about 5 to 95 wt.% of the total monomers charged to said polymerization reaction.

4,532,295

POLYMERIZATION PROCESS FOR AQUEOUS POLYMER DISPERSIONS OF VINYL ESTERS AND ETHYLENIC MONOMERS

Hartmut Brabetz; Herbert Eck; Reinhard Jira, and Heinrich Hopf, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,672

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323851

Int. Cl.[3] C08F *210/02*; C08L *31/04*; C09J *3/14*; C04B *13/24*

U.S. Cl. 524—827 **12 Claims**

1. A process for the preparation of aqueous polymer dispersions consisting essentially of polymerizing vinyl esters and up to 50% by weight of the total monomer of compounds with

unsaturated ethylenic bonds at a temperature of 10° to 100° C. in the presence of an at least partially water-soluble free-radical initiator and of at least one starch member of the group consisting of cyanalkylated starch, hydroxyalkylated starch and carboxyalkylated starch with the starting mixture containing not more than one third of the total monomers and the remaining monomers being added by metering during the polymerization, the initiators being at least one member of the group consisting of hydrogen peroxide and organic hydroperoxides in an amount of at least 30 mmol per kg of total monomer mixture and the amount of starch being at least 1% by weight based on the total monomer weight.

4,532,296

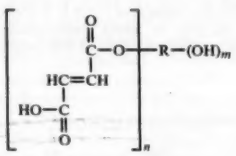
PROCESS FOR PRODUCING LOW VISCOSITY CURABLE POLYESTER RESIN COMPOSITIONS

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1984, Ser. No. 626,145
Int. Cl.[3] C08G *63/76;* **C08L** *67/00*
U.S. Cl. 525—48 **20 Claims**

1. A process for preparing a resin composition comprising the steps of:

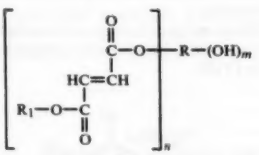
(a) contacting a molar excess of an alpha, beta unsaturated dicarboxylic acid or derivative thereof with an organic polyol for a time and at a temperature sufficient to form a composition comprising a carboxylic acid terminated polyester having the formula:



(I)

wherein n is a number having an average value of about 2 to less than about 4, m is a number equal to the free valence of R less the average value of n, the ratio of n to m is greater than about 2.0, and R is the residuum of a polyester which contained from 2 to 4 inclusive hydroxyl groups;

(b) contacting a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof with the carboxylic acid terminated polyester of (a) in the presence of a non-oxidizing acid catalyst having a non-nucleophilic anion for a time and at a temperature sufficient to form a composition comprising an unsaturated ester having the formula:



(II)

wherein n, m and R are as defined above and R_1 is the residuum of a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof having from 2 to about 20 carbon atoms; and

(c) admixing a copolymerizable ethylenically unsaturated monomer with the unsaturated ester of (b).

4,532,297

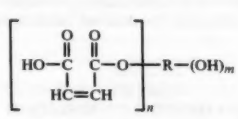
LOW VISCOSITY CURABLE POLYESTER RESIN COMPOSITIONS AND A PROCESS FOR THE PRODUCTION THEREOF

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1984, Ser. No. 626,146
Int. Cl.[3] C08G *63/76;* **C08L** *67/00*
U.S. Cl. 525—48 **18 Claims**

1. A process for preparing a resin composition comprising the steps of:

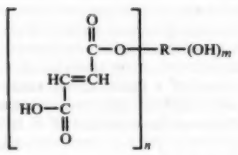
(a) contacting maleic acid or anhydride with an organic polyol for a time and at a temperature sufficient to form a composition comprising a maleate ester having the formula:



(I)

wherein n is a number having an average value of about 2 to less than about 4, m is a number equal to the free valence of R less the average value of n, the ratio of n to m is greater than about 2.0, and R is the hydroxyl-free residue of an organic polyol which contained from 2 to 4 inclusive hydroxyl groups;

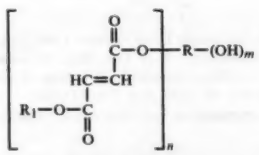
(b) heating the maleate ester of (a) in the presence of a catalyst for a time and at a temperature sufficient to form a composition comprising a fumarate ester having the formula:



(II)

wherein n, m and R are as defined above;

(c) contacting a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof with about stoichiometric amounts of carboxyl groups of the fumarate ester of (b) in the presence of a non-oxidizing acid catalyst having a non-nucleophilic anion for a time and at a temperature sufficient to form a composition comprising an unsaturated ester having the formula:



(III)

wherein n, m and R are as defined above and R_1 is the residuum of a Diels-Alder adduct of cyclopentadiene with an olefinic or acetylenic hydrocarbon or alkylated derivative thereof having from 2 to about 20 carbon atoms; and

(d) admixing a copolymerizable ethylenically unsaturated monomer with the unsaturated ester of (c).

4,532,298

COMPRESSION-RESISTANT WATER-SWELLABLE RUBBER COMPOSITION AND WATERTIGHT SEALING MATERIAL COMPRISING THE SAME

Toshihiro Kimura, Ageo; Kazuhiro Takasaki, Warabi; Hiroshi Harima, and Yoshihiro Yoshioka, both of Iharaki, all of Japan, assignors to C. I. Kasei Co. Ltd., Tokyo and Kuraray Isoprene Chemical Co. Ltd., Ibaraki, both of, Japan

Filed Feb. 6, 1984, Ser. No. 577,355
Claims priority, application Japan, Feb. 8, 1983, 58-19044
Int. Cl.³ C08L 53/00
U.S. Cl. 525—96 12 Claims

1. A water-swellable rubber composition which comprises:
(a) 100 parts by weight of a chloroprene rubber;
(b) from 5 to 300 parts by weight of a highly water-absorptive resin;
(c) from 3 to 100 parts by weight of a rubbery polymer; and
(d) a metal oxide-based vulcanizing agent which vulcanizes the chloroprene rubber but does not vulcanize the rubbery polymer.

4,532,299

FLEXIBILIZED CHEMICALLY RESISTANT EPOXY RESIN

James A. Seneker, Anaheim, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 338,876, Jan. 12, 1982, abandoned. This application Jan. 21, 1983, Ser. No. 459,793
Int. Cl.³ C08F 283/10
U.S. Cl. 525—122 21 Claims

1. A method for flexibilizing an epoxy resin having at least two terminal epoxy groups comprising:
(a) preparing a dicarboxy-terminated prepolymer by reacting a stoichiometric excess of a carboxylic anhydride with each hyroxyl equivalent of a polybutadiene having terminal allylic hydroxyl groups and a minor amount of pendent vinyl groups, at a temperature of from about 125° to about 140° and for a time sufficient for substantially all of the terminal hydroxyl groups to form first ester linkages with anhydride molecules resulting in a prepolymer having a functional carboxyl group at each end;
(b) reacting an excess of a liquid epoxy resin with each carboxyl equivalent of the dicarboxy-terminated prepolymer at a temperature of from about 180° F. to about 200° F. for a time sufficient to yield an elastomerically modified resin having at least two terminal epoxy groups, the epoxy resin in such elastomerically modified resin being linked to the prepolymer via a second ester linkage;
(c) mixing a vinyl monomer in an amount of from about 2% to about 25% by weight of the elastomerically modified resin with the elastomerically modified resin to yield an uncured product; and
(d) mixing epoxy and vinyl polymerization catalysts to the uncured product to effect epoxy copolymerization and vinyl copolymerization to thereby yield a cured flexibilized resinous mass.

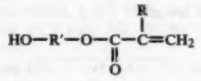
4,532,300

PRODUCTION OF COATINGS

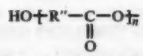
Werner Lenz, Bad Durkheim; Hans Sander, Ludwigshafen, and Dieter Möller, Ascheberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,024
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226131
Int. Cl.³ C08F 8/30, 265/00
U.S. Cl. 525—124 36 Claims

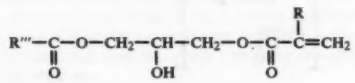
1. A process for the production of a coating which comprises: reacting
(A) a polyhydroxy polyacrylate resin comprising esters of acrylic acid or methacrylic acid with monofunctional aliphatic alcohols, monoesters of acrylic acid or methacrylic acid with polyfunctional aliphatic alcohols and other copolymerizable olefinically unsaturated monomers with
(B) isocyanurate-containing polyisocyanates which have a functionality of from 2.5 to 6 and which may be partially or completely blocked with CH—, NH— or OH—acidic blocking agents,
wherein the polyhydroxy polyacrylate resin (A) used is a hydroxyl-containing copolymer comprising
(a) from 6 to 70% by weight of one or more esters of the formula



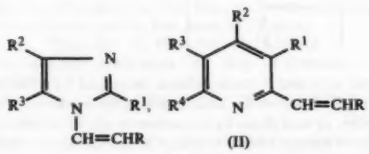
where R is hydrogen or methyl, R′ is straight-chain or branched alkylene of 2 to 18 carbon atoms or an alkylene radical of 7 to 17 carbon atoms which contains not more than three cycloaliphatic groups, and, if appropriate, some or all of the groups HO—R′— can be replaced by the group Z—O—R′—, where Z is a radical of the formula



where n is an integer from 1 to 3 and R″ is an alkylene chain of 4 to 8 carbon atoms which may additionally contain from 1 to 3 alkyl substituents having in total not more than 10 carbon atoms or a cycloaliphatic radical of 6 to 10 carbon atoms or an unsubstituted or alkyl-substituted aromatic radical of 6 to 8 carbon atoms or an araliphatic radical of 7 to 9 carbon atoms or an alkoxy radical of 1 to 8 carbon atoms,
(b) from 0 to 40% by weight or from 0 to 50% by weight, respectively, of one or more hydroxyalkyl esters of acrylic acid or methacrylic acid of the formula

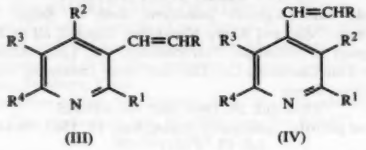


where R is hydrogen or methyl and R‴ is an alkyl radical of a branched aliphatic carboxylic acid of 4 to 26 carbon atoms,
(c) from 10 to 50% by weight of one or more alkyl acrylates or methacrylates which form homopolymers having glass transition temperatures of from +5° C. to +120° C.,
(d) from 0 to 10% by weight of a vinyl-aromatic,
(e) from 10 to 60% by weight of one or more alkyl esters, or alkylglycol esters containing not more than 2 etheroxygen bridges, of acrylic acid or methacrylic acid, which esters form homopolymers having glass transition temperatures of from −80° C. to +4.5° C.,
(f) from 0 to 10% by weight of an acrylamide or methacrylamide which may or may not be substituted at the amide nitrogen by one or two alkyl radicals of 1 to 8 carbon atoms, which may contain a carbonyl group, or by one or two phenyl radicals,
(g) from 1 to 25% by weight of one or more polymerizable, olefinically unsaturated, heterocyclic compounds of the formulae (I) to (VIII)

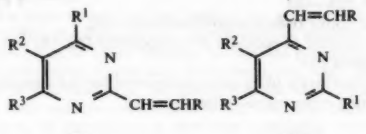


(I) (II)

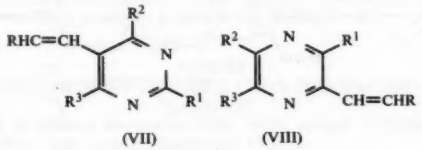
-continued



(III) (IV)



(V) (VI)



(VII) (VIII)

where R is hydrogen or methyl and R^1, R^2, R^3 and R^4 are identical or different and are each hydrogen, methyl, ethyl, straight-chain or branched alkyl of 3 or 4 carbon atoms, phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, halogen or nitro, a group of the formula $—R^I—A—R^{II}$, where A is oxygen or sulfur, R^I is methylene or ethylene or is phenylene which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, halogen or nitro, and R^{II} is methyl or ethyl or is phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, halogen or nitro, or R^1, R^2, R^3 and R^4 are each halogen, nitro or a group of the formula $—OR^{III}$, $—COOR^{III}$, $—SO_2R^{III}$, $—CONR^{III}R^{IV}$ or $—SO_2NR^{III}R^{IV}$, where R^{III} and R^{IV} are identical or different and are each methyl, ethyl, a straight-chain or branched alkyl radical of 3 or 4 carbon atoms or phenyl which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, halogen or nitro, and furthermore, R^2 and R^3 in formulae (I), (II), (III), (V), (VI) and (VIII) or R^3 and R^4 in formula (III), and either R^3 and R^4 or R^1 and R^2 or R^3 and R^4 as well as R^1 and R^2 in formulae (II) and (IV), together with the heterocyclic structure, can form a fused six-membered aromatic ring which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, halogen or nitro, and

(h) from 0 to 20% by weight of monomers which are not mentioned under (a) to (g) and whose copolymerized radicals are inert to isocyanate groups,

with the proviso that the sum of the percentages stated under (a) and (b) is from 6 to 70, the sum of the percentages stated under (c), (d) and (g) is from 11 to 60 and the sum of the percentages of the components stated under (a) to (h) is 100, and the isocyanurate-containing polyisocyanate (B) with a functionality of from 2.5 to 6 is one which predominantly contains cycloaliphatically bonded isocyanate groups.

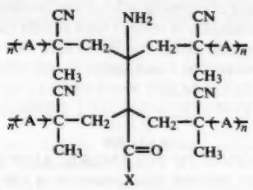
4,532,301

RADIAL BLOCK POLYMERS

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 5, 1984, Ser. No. 668,060
Int. Cl.³ C08F *293/00*
U.S. Cl. 525—280 **10 Claims**

1. A radial block polymer having at least four arms and the following general formula:



wherein each R separately represents a methyl or ethyl moiety; each A separately represents at least one free radically polymerizable monomer; X represents —OH, $—O(B)_n$, $—S—(B)_n$ or $NH(B)_n$; B represents at least one free radically polymerizable monomer; and, each n separately represents an integer greater than or equal to 50.

4,532,302

PROCESS FOR THE SULFONATION OF AN ELASTOMERIC POLYMER

Joseph Wagensommer, Westfield; Robert R. Klein, Berkeley Heights, and Robert D. Lundberg, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 383,724, Jun. 1, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 627,080
Int. Cl.³ C08F *8/36*
U.S. Cl. 525—343 **16 Claims**

1. A continuous process for sulfonating an elastomeric polymer which comprises the steps of:

(a) forming a cement of said elastomeric polymer by dissolving said elastomeric polymer in a non-reactive solvent selected from the group consisting of chlorinated aliphatic hydrocarbon, a chlorinated aromatic hydrocarbon, an aromatic hydrocarbon and an aliphatic hydrocarbon, said elastomeric polymer being selected from the group consisting of a Butyl rubber, a styrene-butadiene copolymer, an isoprene-styrene copolymer and an EPDM terpolymer;

(b) continuously contacting a sulfonating agent with said cement for about 2 to about 9 minutes at about −50° C. to +100° C. to form an unneutralized sulfonated elastomeric polymer;

(c) continuously transferring said cement of said unneutralized sulfonated elastomeric polymer to a staged, neutralization vessel;

(d) continuously quenching said sulfonation reaction with an aliphatic alcohol, a cycloaliphatic alcohol, water or an aromatic hydroxyl compound in said staged, neutralized vessel; and

(e) continuously neutralizing in said staged neutralization vessel said unneutralized sulfonated elastomeric polymer with a solution of a metallic salt of a carboxylic acid having about 1 to about 4 carbon atoms to form a neutralized sulfonated elastomeric polymer, wherein a counterion of said metallic salt of said carboxylic acid is selected from the group consisting of aluminum, antimony, lead, and Groups IA, IB, IIA and IIB of the Periodic Table of Elements.

4,532,303

PREPARATION OF ANIONIC AND CATIONIC POLYMERS FROM 2-OXAZOLINES

Michael J. Fazio, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 524,719, Aug. 19, 1983,. This application Sep. 26, 1984, Ser. No. 654,584
Int. Cl.³ C08F *8/36*
U.S. Cl. 525—344 **10 Claims**

1. A process for preparing a polymer containing at least one pendant sulfonate moiety wherein a 2-alkenyloxazoline or

2-alkenyloxazine is subjected to vinyl polymerization and the resulting polymer comprising at least one pendant 2-oxazoline or oxazine functionality is reacted with at least one monobasic salt of sulfurous acid under conditions such that said pendant 2-oxazine or 2-oxazoline functionality is converted to a sulfonate moiety.

4,532,304

MODIFICATION OF POLYMERIC AMINE SALTS

Michael J. Fazio, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 13, 1984, Ser. No. 579,247
Int. Cl.³ C08F *8/08*
U.S. Cl. 525—385 **15 Claims**

1. A process for modifying polymeric amine salts containing a halide ion comprising:

admixing said polymeric amine salt with a sufficient amount of lower alkyl oxide to convert at least a portion of said halide ions to halo-hydrins whereby a free amine site is formed on said polymeric amine.

4,532,305

THERMOPLASTIC POLYMER PLASTICIZED WITH A POLY(ARYL ETHER)

Barry L. Dickinson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 393,557, Jun. 30, 1982, abandoned.
This application Aug. 6, 1984, Ser. No. 637,697
Int. Cl.³ C08L *69/00, 71/00, 79/08*
U.S. Cl. 525—390 **11 Claims**

1. A plasticized thermoplastic polymer composition comprising in admixture, a thermoplastic polymer selected from a polyarylate derived from a dihydric phenol and at least one aromatic dicarboxylic acid, a polyetherimide, an aromatic polycarbonate, a poly(aryl ether) having a molecular weight in excess of 10,000, and mixtures thereof, and a plasticizing amount of a poly(aryl ether) having a molecular weight of from about 1000 to about 5000.

4,532,306

POLYPHENYLENE ETHER RESIN COMPOSITION

Akitoshi Sugio, Ohmiya, and Masao Okabe, Abiko, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,323
Claims priority, application Japan, Oct. 21, 1983, 58-197308
Int. Cl.³ C08L *71/04*
U.S. Cl. 525—397 **5 Claims**

1. A polyphenylene ether resin composition comprising

(A) a polyphenylene ether resin and

(B) poly(epsilon-caprolactone).

4,532,307

POLYMER COMPOSITION

Seiichi Tada, Ichihara, Japan, assignor to Du Pont-Mitsui Polychemicals Co., Ltd., Tokyo, Japan

Division of Ser. No. 631,835, Jul. 17, 1984,. This application Oct. 1, 1984, Ser. No. 656,733
Claims priority, application Japan, Jul. 22, 1983, 58-133940; Jul. 22, 1983, 58-133941; Nov. 8, 1983, 58-209537
Int. Cl.³ C08L *23/08, 31/04*
U.S. Cl. 525—451 **7 Claims**

1. A polymer composition comprising an ethylenevinyl acetate-carbon monoxide copolymer and an epoxy compound selected from the group consisting of a nitrogen-containing epoxy compound and an alicyclic epoxy compound.

4,532,308

EPOXY RESIN COMPOSITION

Tadahide Sato; Kuniaki Tobukuro, both of Shiga; Tosio Sugimoto, Mie, and Kaoru Kanayama, Ibaraki, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Yuka Fine Chemicals Co., Ltd. and Toray Industries, Inc., all of Tokyo, Japan

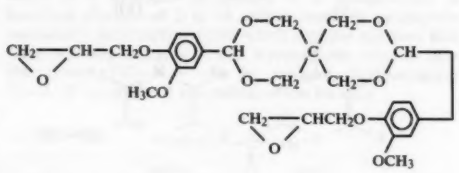
Filed Jul. 24, 1984, Ser. No. 633,925
Claims priority, application Japan, Aug. 11, 1983, 58-145677
Int. Cl.³ C08G *59/26*
U.S. Cl. 525—482 **3 Claims**

1. An epoxy resin composition comprising

(1) a mixture of epoxides of Components (A), (B) and (C)

Component (A)

20 to 60 wt% of an epoxy compound having a spiroacetal ring represented by the formula:



Component (B):

10 to 50 wt% of a brominated epoxy resin

Component (C):

10 to 50 wt% of an epoxy resin selected from the group consisting of diglycidyl ether of bisphenol A, diglycidyl ether of bisphenol F, novolac type epoxy resins and N,N,O-triglycidyl-aminophenol type epoxy resins, and

(2) a hardening agent.

4,532,309

WATER-BASED EPOXY RESINS STABLE TO HYDROLYSIS

Andreas Lindert, Troy, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Nov. 28, 1980, Ser. No. 210,878
Int. Cl.³ C08F *283/10;* C08L *63/10*
U.S. Cl. 525—488 **31 Claims**

1. The free radical reaction product of:

an epoxy resin having at least two epoxy groups per molecule and having an organic unsaturated functional site; and

an acid functional vinyl monomer,

said epoxy resin and acid-functional monomer being reacted in amounts from 1% to 90% and 10% to 99%, respectively, and the resulting reaction product having an actual acid number of at least 15.

4,532,310

CONTACTING ARYLENE SULFIDE POLYMER WITH OXYGEN IN EXTRUDER BY CONTINUOUS PROCESSING

Don C. Christensen, and Raymond G. Voss, both of Suite 1107, 1825 K St., NW., Washington, D.C. 20006

Filed May 29, 1984, Ser. No. 614,610
Int. Cl.³ C08G *75/16*
U.S. Cl. 525—537 **8 Claims**

1. A method for continuous treatment of arylene sulfide polymer comprising contacting said polymer with oxygen while passing said polymer through an extruder operating at conditions to produce a mixing action at temperature above the melting point of the polymer, said oxygen supplied in an amount to attain a reduction of melt flow for a fixed residence time within the extruder.

4,532,311

PROCESS FOR REDUCING SHEETING DURING POLYMERIZATION OF ALPHA-OLEFINS

Bernard D. Fulks, Victoria, Tex.; Steven P. Sawin; Collin D. Aikman, both of Charleston, and John M. Jenkins, III, South Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 244,990, Mar. 26, 1981, abandoned. This application Sep. 14, 1984, Ser. No. 650,571

Int. Cl.[3] C08F *2/34*

U.S. Cl. 526—62 15 Claims

1. An improvement in the method for polymerization of alpha-olefins in a fluidized bed reactor utilizing titanium based catalysts prone to cause sheeting during said polymerization, the improvement comprising maintaining the static electric charge in said reactor at the site of possible sheet formation below static voltage levels which would otherwise cause sheet formation, by introducing a chromium containing compound into said reactor in such manner as to contact the surfaces of said reactor, said chromium in said chromium containing compound being present in a valence state of 2 or 3.

4,532,312

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Bartlesville, Okla. 74004, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 449,933, Dec. 15, 1982, Pat. No. 4,477,588. This application Jun. 7, 1984, Ser. No. 618,019

Int. Cl.[3] C08F *4/02, 10/06*

U.S. Cl. 526—119 11 Claims

1. A process for the polymerization of propylene comprising contacting propylene under polymerization conditions with a catalyst comprising the product resulting when reactants comprising

(a) magnesium dihalide,

(b) 4-phenyl phenol,

(c) ethyl benzoate, and

(d) titanium tetra-n-butoxide

are reacted to form a first catalyst component and said first catalyst component is reacted with an organoaluminum halide comprising ethyl-aluminum sesquichloride and then the solid product of that reaction is reacted with a mixture of halogen containing compounds comprising $TiCl_4$, $HSiCl_3$, and $SiCl_4$, wherein the sum of the volumes of $HSiCl_3$ and $SiCl_4$ in the mixture is about equal to volume of $TiCl_4$ in the mixture.

4,532,313

METHOD FOR PREPARING AN IMPROVED CATALYST SUPPORT, ZIEGLER-NATTA CATALYST UTILIZING SAID SUPPORT AND POLYMERIZATION OF 1-OLEFINS UTILIZING SAID CATALYST

Albert S. Matlack, Hockessin, Del., assignor to HIMONT Incorporated, Wilmington, Del.

Continuation of Ser. No. 606,546, May 3, 1984, abandoned, which is a continuation of Ser. No. 434,099, Oct. 13, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,251

Int. Cl.[3] C08F *4/02, 10/00, 4/64;* C01F *5/30*

U.S. Cl. 526—125 10 Claims

1. In a process for the preparation of an essentially anhydrous magnesium chloride support for use in the polymerization of 1-olefins, having the steps of (1) precipitating the product formed by contacting a hydrocarbon solution of a magnesium alkanoate with a hydrocarbon solution of an alkylaluminum dichloride, (2) isolating the precipitation product from the hydrocarbon precipitation medium, (3) successively washing the precipitation product with a hydrocarbon solvent, (4) contacting the washed precipitation product with an electron donor, and (5) washing the electron donor-treated precipitation product with a hydrocarbon solvent, the improvement which comprises contacting the hydrocarbon solution of said magnesium alkanoate with the hydrocarbon solution of said alkylaluminum dichloride in a liquid hydrocarbon reaction medium containing from about 0.05 to about 0.6 mole alkylaluminum dichloride per liter and from about 0.05 to about 0.8 mole alkylaluminum alkanoate chloride per liter.

4,532,314

METHOD OF SUSPENSION POLYMERIZATION OF VINYL CHLORIDE UTILIZING HYDROXYPROPYL GUAR

Helmut K. Maier, Golden Valley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 28, 1983, Ser. No. 470,512

Int. Cl.[3] C08F *2/20*

U.S. Cl. 526—200 7 Claims

1. In a method of suspension polymerization of vinyl chloride or vinyl chloride and other monomers copolymerizable therewith, the improvement comprising employing an effective amount of hydroxypropyl guar as a suspending agent wherein said hydroxypropyl guar has a molar substitution of at least 0.6.

4,532,315

RAPIDLY HARDENING ORGANOPOLYSILOXANE COMPOSITIONS COMPRISING POLYACYLOXYSILANE CROSS-LINKING AGENTS

Michel Letoffé, Sainte-Foy Les Lyon; Roger Favre, and Patrice Perrin, both of Lyons, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jan. 25, 1984, Ser. No. 573,611

Claims priority, application France, Jan. 27, 1983, 83 01504

Int. Cl.[3] C08G *77/06*

U.S. Cl. 528—14 12 Claims

1. An organopolysiloxane composition comprising (A) 100 parts by weight of essentially α,ω-di(hydroxy)diorganopolysiloxane polymers having a viscosity of 700 to 1,000,000 mPa.s at 25° C., and which polymers comprise recurring diorganosiloxy units of the formula R_2SiO, in which the symbols R, which may be identical or different, are hydrocarbon radicals having from 1 to 8 carbon atoms, or halo or cyano substituted such radicals; (B) 2 to 20 parts by weight of a polyacycloxysilane cross-linking agent of the general formula $R_pSi(OCOR')_{4-p}$ in which R is as defined above, R' is a hydrocarbon radical devoid of aliphatic unsaturation and having from 1 to 15 carbon atoms, and p ranges from zero to 1; (C) 0 to 150 parts by weight of inorganic filler material; and (D) 0.01 to 7 parts by weight, per 100 parts by weight of (A)+(B)+(C), of a hardening accelerator which comprises an alkali or alkaline earth metal hydroxide.

4,532,316

PHASE SEPARATING POLYURETHANE PREPOLYMERS AND ELASTOMERS PREPARED BY REACTING A POLYOL HAVING A MOLECULAR WEIGHT OF 600–3500 AND ISOCYANATE AND A LOW MOLECULAR WEIGHT CHAIN EXTENDER IN WHICH THE RATIOS OF REACTANTS HAVE A LIMITED RANGE

Robert L. Henn, Wilmington, Del., assignor to W. L. Gore & Assoc., Inc., Newark, Del.

Filed May 29, 1984, Ser. No. 614,131

Int. Cl.[3] C08G *18/10*

U.S. Cl. 528—59 59 Claims

1. A reactive, 100 percent solids, storage stable segmented, phase-separating polyurethane prepolymer having soft segments and suitable hard segments comprising the reaction product of:

(i) a polyol (A) having a number average molecular weight of from about 600 to about 3500 and having a functionality of at least 2;

(ii) an isocyanate (B) having a functionality of at least 2; and

(iii) a low molecular weight chain extender (C) having a molecular weight in a range lower than about 500 and having a functionality of at least 2, wherein the reactants

are employed in such proportions so as to satisfy the following equations:

$$\frac{Eq_{NCO}}{Eq_{OH} + Eq_{CE}} \geq 1.1 \quad (a)$$

$$Eq_{OH} \geq Eq_{CE} \quad (b)$$

$$Eq_{CE} > O, \quad (c)$$

wherein Eq_{NCO} denotes the equivalents of the isocyanate species employed, and Eq_{OH} and Eq_{CE} denote the respective molar equivalents of the polyol and chain extender employed, said soft segments provided by the polyol and said suitable hard segments provided by the reaction product of the isocyanate and chain extender and which induce phase-separation of said hard and soft segments in said prepolymer as a result of thermodynamic incompatibility between said hard and soft segments, said prepolymer being an opaque solid at room temperature.

4,532,317

AROMATIC POLYAMINES CONTAINING PRIMARY AROMATIC AMINO GROUPS, URETHANE GROUPS AND POLYESTER GROUPS, AND A PROCESS FOR THE PRODUCTION THEREOF

Werner Rasshofer, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,461

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223395

Int. Cl.³ C07C *127/15, 127/24*

U.S. Cl. 528—60 **27 Claims**

1. A process for the production of an aromatic polyamine containing aromatic primary amino groups and urethane and polyester groups by

(a) hydrolyzing

(i) an isocyanate compound having aromatic isocyanate groups and an isocyanate content of from 0.5 to 11.5 wt % which isocyanate compound also contains urethane and polyester groups in the presence of

(ii) a compound selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal silicates, alkali metal sulfides, alkali metal cyanides, tetraalkylammonium hydroxides and mixtures thereof; and

(iii) water in a quantity such that at least one mole of water is present for each equivalent of NCO groups; and

(b) treating the hydrolyzed mixture to convert the carbamate formed in (a) to polyamine

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4,532,318

PROCESS FOR REMOVING TRACE AMOUNTS OF HYDRAZINE

Allassan Abubakari, San Jose, and Alfred H. Holstein, Los Altos, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 5, 1984, Ser. No. 647,947

Int. Cl.³ C08F *6/00;* **C08G** *00/00;* **C08J** *3/00*

U.S. Cl. 528—483 **4 Claims**

1. A method for removing trace amounts of hydrazine from pharmaceutical grade PVP comprising:

contacting an aqueous solution of PVP with a gaseous ozone stream for a period of time required to remove detectable amounts of hydrazine.

4,532,319

SOLID STATE POLYMERIZATION OF POLYESTER

Paul R. Wendling, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 13, 1984, Ser. No. 649,882

Int. Cl.³ C08G *63/26*

U.S. Cl. 528—274 **20 Claims**

1. In the process for solid state polymerizing a polyester prepolymer to a high molecular weight polyester resin in the presence of a stream of inert gas at an elevated temperature, the improvement which comprises pulsing the inert gas through the polyester prepolymer.

4,532,320

REMOVAL OF PHYSIOLOGICALLY UNACCEPTABLE SOLVENTS FROM POLYMERS CONTAINING CARBOXYL OR ANHYDRIDE GROUPS

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Gerhard Faulhaber, Bad Durkheim, and Hans-Juergen Rauben Heimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,240

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302495

Int. Cl.³ C08F *6/00*

U.S. Cl. 528—498 **5 Claims**

1. A process for removing physiologically unacceptable solvents from a polymer containing carboxyl or anhydride groups, said polymer being selected from the group consisting of homopolymers and copolymers of ethylenically unsaturated C_3–C_6-carboxylic acids, copolymers of maleic anhydride with C_2–C_4-olefins, copolymers of maleic anhydride with styrene, copolymers of maleic anhydride with C_1–C_4-alkyl vinyl ethers, and crosslinked copolymers obtained by copolymerization of said carboxylic acids and maleic anhydride in the presence of an ethylenically diunsaturated or polyunsaturated monomer, wherein the polymer is treated with aliphatic hydrocarbons at a temperature which is at or above its glass transition temperature.

4,532,321

MICROCRYSTALLINE CHITIN AND METHOD OF MANUFACTURE

John E. Castle, and Jeffrey R. Deschamps, both of Lewes, Del., assignors to University of Delaware, Newark, Del.

Filed Jun. 14, 1982, Ser. No. 387,991

Int. Cl.³ C08B *37/08*

U.S. Cl. 536—20 **5 Claims**

1. A process for preparing free amino microcrystalline chitin, which comprises the steps of:

(a) Suspending at least once a partially acid-hydrolyzed particulate chitin acid salt of molecular weight of about 5,000 to about 450,000 in a water solution of an alkaline material in an amount sufficient that the dispersion on last contact is alkaline, whereby to convert the deacetylated amino acid salt groups to free amino groups;

(b) Washing said particulate at least once;

(c) Shearing the washed product in liquid suspension until a smooth emulsion is formed;

(d) Freezing said emulsion and thereafter thawing, whereby to precipate said free amino microcrystalline chitin; and

(e) Recovering said free amino microcrystalline chitin.

4,532,322
PREPARATION OF THIAZINE DERIVATIVES

Arthur Jackson, Washington, and Graham Heyes, Durham, both of England, assignors to Fine Organics Limited, Middlesbrough, England

Filed May 23, 1984, Ser. No. 613,104
Claims priority, application United Kingdom, May 23, 1983, 8314245
Int. Cl.[3] C07D 279/04
U.S. Cl. 544—54 7 Claims

1. A method for the preparation of a thiazine derivative of the formula

where each R is independently selected from hydrogen or a lower alkyl having 1 to 4 carbon atoms, the method comprising reacting together a sulphur donor which is selected from sulfur, ammonium or alkali metal sulfides, ammonium or alkali metal hydrosulfides, or hydrogen sulfide, 1,1-bis(methylthio)-2-nitroethene and a compound of the formula

$$H_2NCR_2CR_2CR_2OSO_3H$$

where each R is as defined above.

4,532,323
PROCESS FOR THE PREPARATION OF TRIPHENDIOXAZINE COMPOUNDS

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,471
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339923
Int. Cl.[3] C07D 498/04
U.S. Cl. 544—75 10 Claims

1. Process for the preparation of triphendioxazine compounds, characterized in that a 2,5-diarylaminobenzoquinone compound is treated with oleum in the presence of iodine or an inorganic iodine compound.

4,532,324
CATALYTIC PROCESS FOR THE COPRODUCTION OF MORPHOLINE AND 2-(2-HYDROXYETHOXY)ETHYLAMINE FROM DIETHYLENE GLYCOL

Terry L. Renken, and John R. Sanderson, both of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,772
Int. Cl.[3] C07D 295/02
U.S. Cl. 544—106 5 Claims

1. In the catalytic reductive amination of diethylene glycol for the coproduction of morpholine and 2-(2-hydroxyethoxy)ethyl amine, the improvement for obtaining an enhanced yield of 2-(2-hydroxyethoxy)ethyl amine which comprises the step of:

conducting said reductive amination of diethylene glycol in the presence of a catalyst consisting of cobalt, copper and ceria and/or thoria.

4,532,325
CARBONYLATION PROCESS

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 139,151, Apr. 11, 1980, Pat. No. 4,321,211, which is a division of Ser. No. 17,717, Mar. 5, 1979, abandoned, which is a division of Ser. No. 799,589, May 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 166,615, Jul. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,669, Jul. 1, 1970, abandoned. This application Jan. 4, 1982, Ser. No. 336,578
Int. Cl. C07F 15/06, 15/04, 15/00, 11/00
U.S. Cl. 546—2 11 Claims

1. A magnesium Group VIII transition metal carbonyl and substituted carbonyl complex having the following formula:

$$B_4Me[Me'(CO)_a(L)_b]_2$$

wherein B is pyridine and substituted pyridines of the formula:

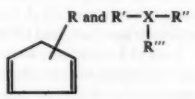
wherein

R_6 is a C_1 to C_{10} hydrocarbyl radical and z is an integer ranging from 0 to 5;

Me is magnesium;

Me′ is a transition metal selected from the group consisting of the metals of Group VIII of the Periodic Table of the Elements;

L is a uni- or polydentate ligand or hydrocarbon residue which is selected from the group consisting of compounds of the following formula:



wherein

R, R′, R″ and R‴ are radicals independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{20} aryl, C_7 to C_{20} aralkyl and alkaryl, and X is selected from the group consisting of N, P, As and Sb

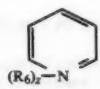
a is an integer ranging from 1 to 4;

b is an integer ranging from 0 to 3, with the proviso that the sum of a and b is 5 or less.

2. A magnesium Group VIII transition metal carbonyl and substituted carbonyl complex having the following formula:

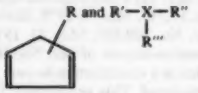
$$B_4Me[Me'(CO)_a(L)_b]_2$$

wherein B is a pyridine and substituted pyridines of the formula:



wherein R_6 is a C_1 to C_{10} hydrocarbyl radical and z is an integer ranging from 0 to 5, Me is magnesium, Me′ is a transition metal selected from the group consisting of metals of Group VIB, VIIB and VIII of the Periodic Table of Elements, L is a uni- or polydentate ligand or hydrocarbon capable of

coordinating with said transition metals and which is selected from the group consisting of compounds of the following formula



wherein R, R', R'' and R''' are radicals independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{20} aryl, C_7 to C_{20} aralkyl and alkaryl, and X is selected from the group consisting of N, P, As and Sb, a is a positive integer ranging from 1 to 5 and b is an integer ranging from 0 to 4, with the proviso that the sum of a and b is 5 or less.

4,532,326

DECARBOXYLATION PROCESS FOR PREPARING 4-(3-AMINOPHENYL)PYRIDINES

Paul F. Ranken, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 29, 1983, Ser. No. 537,085
Int. Cl.³ C07D *215/16, 213/24*
U.S. Cl. 546—156 **5 Claims**

1. A process which comprises heating a 2-amino-4-(4-pyridinyl)benzoic acid at a decarboxylation temperature in the range of about 200°–300° C. to prepare a 4-(3-aminophenyl)-pyridine.

4. In a process for preparing a 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylic acid by (a) reacting a 4-(3-aminophenyl)pyridine with a dialkyl ethoxymethylenemalonate, (b) cyclizing the resultant dialkyl 3-(4-pyridyl)anilinomethylenemalonate, (c) N-alkylating the resultant alkyl 1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, and (d) hydrolyzing the resultant alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, the improvement which comprises preparing the 4-(3-aminophenyl)pyridine by heating a 2-amino-4-(4-pyridinyl)benzoic acid at a decarboxylation temperature in the range of about 200°–300° C.

5. In a process for preparing a 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylic acid by (a) converting a 4-(3-aminophenyl)pyridine to a 3-(4-pyridyl)-N-alkylaniline, (b) reacting the 3-(4-pyridyl)-N-alkylaniline with a dialkyl ethoxymethylenemalonate, (c) cyclizing the resultant dialkyl 3-(4-pyridyl)-N-alkylanilinomethylenemalonate, and (d) hydrolyzing the resultant alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, the improvement which comprises preparing the 4-(3-aminophenyl)pyridine by heating a 2-amino-4-(4-pyridinyl)benzoic acid at a decarboxylation temperature in the range of about 200°–300° C.

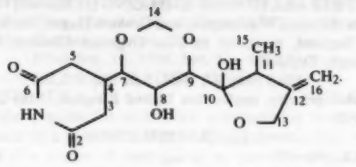
4,532,327

SESBANIMIDE AND THE USE THEREOF IN TREATING LEUKEMIC TUMORS

Richard G. Powell, Peoria, and Cecil R. Smith, Jr., Dunlap, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,469
Int. Cl.³ C07D *405/00*
U.S. Cl. 546—214 **5 Claims**

1. A substantially pure chemotherapeutically active alkaloid compound sesbanimide having the following structure:



4. A chemotherapeutic composition suitable for the remission of leukemia in animals comprising a pharmaceutically acceptable vehicle and an amount of substantially pure sesbanimide effective to promote said remission.

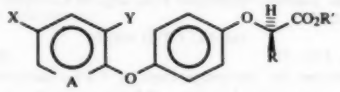
4,532,328

PROCESS FOR MAKING OPTICALLY ACTIVE ESTERS OF PHENOXYPHENOXYPROPIONIC ACIDS OR PYRIDYLOXYPHENOXYPROPIONIC ACIDS

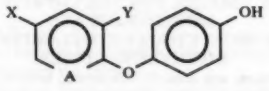
William A. Kleschick, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1983, Ser. No. 513,575
Int. Cl.³ C07D *213/64;* C07C *69/88*
U.S. Cl. 546—302 **6 Claims**

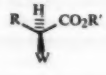
1. A process for making optically active esters of compounds having the formula



wherein X is CF_3, CF_2Z, H, Cl or F; Y is H, Cl or F; Z is H or Cl; A is N or —CH; and R and R' are independently lower alkyl and wherein the optical purity is enhanced which comprises reacting one mole of a phenol compound having the formula



with from 5 to 20 moles of an optically active alkanoate ester substituted in the 2-position with a leaving group and having the formula



wherein W is halogen, alkylsulfonate or arylsulfonate in a dry inert solvent.

4,532,329
3-(R-THIO)PROPIONIC ACID SUBSTITUTED ON ADJACENT CARBON ATOMS BY PYRIDYL AND OPTIONALLY-SUBSTITUTED PHENYL, AND CORRESPONDING OPTIONALLY-SUBSTITUTED ALKYL ESTERS

Pieter T. Haken, Eastling, Nr. Faversham, and Shirley B. Webb, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

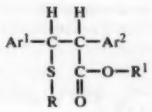
Filed Sep. 26, 1983, Ser. No. 535,461

Claims priority, application United Kingdom, Sep. 27, 1982, 8227481

Int. Cl.³ C07D *213/32*

U.S. Cl. 546—342 **3 Claims**

1. A compound of the formula:



wherein one of Ar^1 and Ar^2 is pyridyl, and the other is phenyl or phenyl substituted by from one to three halogen atoms; R contains from one to eight carbon atoms and is alkyl, haloalkyl, alkoxyalkyl, alkylthioalkyl, cyanoalkyl, carboxyalkyl, alkoxycarbony alkyl acetyloxyalkyl, formyloxyalkyl, hydroxyalkyl, aminoalkyl, cycloalkylalkyl, phenalkyl or phenoxyalkyl; R^1 is hydrogen or alkyl of from one to eight carbon atoms; a salt thereof with a sulfonic acid, a carboxylic acid, a hydrohalic acid, sulfuric acid, an alkali metal, an alkaline earth metal, ammonium, an alkyl-substituted ammonium, and a complex thereof with iron, copper, zinc or manganese salt of the acids described above.

4,532,330
PROCESS FOR PRODUCING DENSIFIED HALOGENATED DIMETHYLHYDANTOINS

Leon M. Cole, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Sep. 30, 1982, Ser. No. 429,160

Int. Cl.³ C07D *211/72, 211/84*

U.S. Cl. 548—311 **11 Claims**

1. A method for producing densified halogenated hydantoins comprising the steps of:

halogenating dimethylhydantoin with a first halogenation agent in the presence of water and a source of calcium and hydroxide ions in order to form a monohalogenated hydantoin intermediate;

thereafter halogenating the monohalogenated intermediate with a second halogenation agent in the presence of water and a source of calcium and hydroxide ions, at least one of the first and second halogenation agents including a source of chlorine;

thereafter separating dihalogenated hydantoin product from the reaction mixture without washing whereby the separated dihalogenated hydantoin product contains calcium chloride and water.

4,532,331
1-BENZYL-2-AMINOMETHYL IMIDAZOLE DERIVATIVES

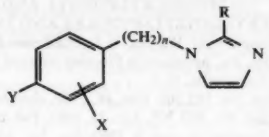
James S. Frazee, Collingswood; Carl Kaiser, Haddon Heights, and Lawrence I. Kruse, Haddonfield, all of N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 12, 1983, Ser. No. 484,123

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—342 **4 Claims**

1. A compound having the formula:



wherein

Y is —H, —OH, $—OCH_3$, —F, $—CF_3$ or C_{1-4} alkyl;

X is —H, —OH, $—OCH_3$, —F, $—CF_3$ or C_{1-4} alkyl, or any accessible combination thereof up to four substituents and wherein at least one of Y and X is —OH;

R_1 is $—CH_2NHR^1$;

R^1 is —H, phenyl or benzyl; and,

n is 0–4,

or a pharmaceutically acceptable acid addition salt or hydrate thereof.

4,532,332
N-(HYDROXYPOLYOXAALKYLENE)PHTHALIMIDES AND SUCCINIMIDES AND ACRYLATE ESTERS THEREOF

Beat Müller, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

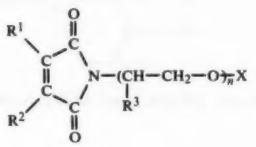
Filed Aug. 5, 1982, Ser. No. 405,472

Claims priority, application Switzerland, Aug. 17, 1981, 5303/81

Int. Cl.³ C07D *207/452, 209/48, 209/52*

U.S. Cl. 548—473 **16 Claims**

1. An imidyl compound of the formula I



(I)

wherein

R^1 and R^2 independently of one another are C_1–C_4-alkyl, or

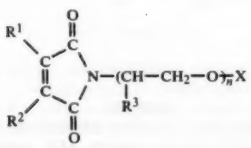
R^1 and R^2 together are tetramethylene,

R^3 is a hydrogen atom or normal C_1–C_4-alkyl,

n is a number from 2 to 30, and

X is a hydrogen atom.

9. An imidyl compound of the formula I



(I)

wherein

R^1 and R^2 independently of one another are C_1–C_4-alkyl, or

R^1 and R^2 together are tetramethylene,

R^3 is a hydrogen atom or normal C_1–C_4-alkyl,

n is a number from 2 to 30, and

X is $—CO—CR^4=CH_2$, in which R^4 is a hydrogen atom or methyl.

4,532,333
1-(AMINOALKYLPHENYL AND AMINOALKYLBENZYL)-INDOLES AND INDOLINES

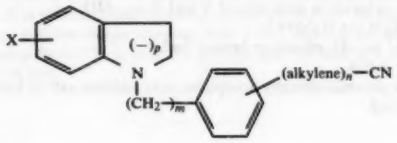
Edward J. Glamkowski, Warren, N.J., and James M. Fortunato, North Wales, Pa., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 562,301, Dec. 16, 1983, abandoned, which is a division of Ser. No. 367,707, Apr. 12, 1982, Pat. No. 4,448,784. This application Aug. 6, 1984, Ser. No. 638,177

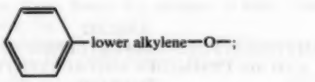
Int. Cl.³ C07D *209/08*

U.S. Cl. 548—490 **19 Claims**

1. A compound having the formula

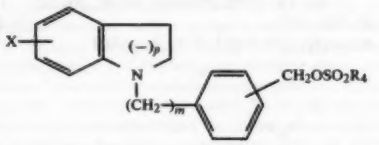


where X is hydrogen, halogen, lower alkoxy, Ar lower alkoxy of the formula

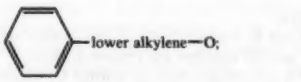


the alkylene moiety having 1 to 5 carbons and m, n and p are independently an integer of 0 or 1.

19. A compound having the formula



where X is hydrogen, halogen, lower alkoxy, Ar lower alkoxy of the formula



and m and p are independently an integer of 0 or 1 and R_4 is lower alkyl or phenyl.

4,532,334
PROCESS FOR MAKING GIBBERELLINS

John V. Turner, P.O. Box 4, Canberra, ACT, Australia (2600), and Russell A. Bell, 84 Hopkins Ct., Dundas, Canada (L9H 5M8)

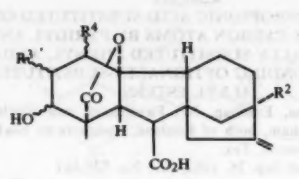
Filed Oct. 28, 1982, Ser. No. 437,281

Claims priority, application Australia, Oct. 30, 1981, PF1367

Int. Cl.³ C07D *307/94*

U.S. Cl. 549—297 **27 Claims**

1. A process for the preparation of compounds of the formula (10):



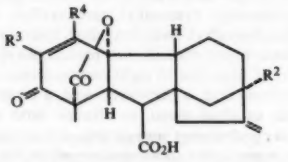
(10)

wherein

R^2 is a radical selected from the group consisting of H; OH; unsubstituted alkoxy, alkoxy substituted by one or more radicals separately selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy and halogen; and acyloxy, wherein acyloxy is a radical derived from carboxylic or sulphonic acids, which is unsubstituted or substituted by one or more radicals separately selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy and halogen;

R^3 and R^4 are radicals separately selected from the group consisting of H and alkyl;

characterised in that the process comprises the reaction of a Δ(1)-3-keto gibberellin of the formula (11):



(11)

wherein R^2, R^3 and R^4 are as defined above; with a compound of the formula (12):

$$M^+(R^6)_3BH^- \quad (12)$$

wherein M^+ represents a monovalent cation and R^6 represents an alkyl group; and the reaction is conducted in the presence of a proton source which will decompose in situ the initial intermediate enol borate formed between the compounds of formulae (11) and (12) without affecting the structural integrity of the carbon skeleton of the compounds of the formula (10).

4,532,335
PREPARATION OF KETENE ACETALS BY REARRANGEMENT OF ALLYL AND SUBSTITUTED ALLYL ACETALS

Robert F. Helwing, San Jose, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Mar. 7, 1983, Ser. No. 473,027

Int. Cl.³ C07D *319/00*

U.S. Cl. 549—335 **5 Claims**

1. The method of rearranging allyl acetals and substituted allyl acetals to produce ketene acetals which comprises heating said acetals in a solution of an alkali metal alkoxide in an ethylene amine.

4,532,336
6'-ALKYLSPECTINOMYCINS

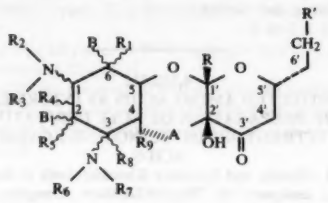
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 359,723, Mar. 19, 1982, abandoned. This application Dec. 13, 1982, Ser. No. 449,304

Int. Cl.³ C07D *323/04*

U.S. Cl. 549—361 **18 Claims**

1. A compound having the formula



wherein R is hydrogen or lower alkyl; R′ is selected from the group consisting of ethyl, n-propyl, n-butyl and an alkyl group cyclic or branch chain system, in which the longest extension of the branch or cyclic system contains from 1 to 4 carbon atoms, inclusive; R_1 through R_9 are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower alkynyl; A is selected from the group consisting of oxygen and sulfur, and B and B_1 are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio-lower alkyl and thio-lower alkenyl, hydrated forms thereof, and pharmaceutically acceptable salts of the compound of formula I and hydrated forms thereof.

13. A compound according to claim 1, 6′-cyclopentylmethylspectinomycin.

17. The compound 6′-undecylspectinomycin.

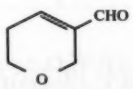
4,532,337

PREPARATION OF 3-FORMYL-5,6-DIHYDRO-2H-PYRAN

Heinz Eckhardt, Ludwigshafen; Klaus Halbritter, Mannheim; Norbert Goetz, Worms, and Gerd Heilen, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 28, 1984, Ser. No. 584,334
Int. Cl.³ C07D *309/00*
U.S. Cl. 549—425 **9 Claims**

1. A process for the preparation of 3-formyl-5,6-dihydro-2H-pyran of the formula



I

by conversion of acrolein in the presence of water, acids and organic solvents at an elevated temperature, wherein the reaction is carried out in the presence of halohydrocarbons of 1 to 6 carbon atoms and 1 to 6 halogen atoms as solvents, at between 60° and 150° C.

4,532,338

PROCESS FOR PRODUCING 2-HALOMETHYL-1,3-CYCLIC ACETAL

Steven E. Pamer, Norton, and James A. Cook, Jr., Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 13, 1983, Ser. No. 513,478
Int. Cl.³ C07D *317/00, 319/06*
U.S. Cl. 549—455 **19 Claims**

1. In the process for producing 2-halomethyl-1,3-cyclic acetal wherein vinyl acetate is halogenated to produce a first reaction mixture containing 1,2-dihaloethyl acetate, said halogen being selected from the group consisting of chlorine and bromine, and 1,2-dihaloethyl acetate in the first reaction mixture is reacted with a C_2–C_4 aliphatic diol to produce a second reaction mixture containing 2-halomethyl-1,3-cyclic acetal and acyclic ester by-products, the improvement which comprises

(a) contacting the second reaction mixture with an aqueous alkaline reagent which provides the strong nucleophilic groups, OH^- in an amount and for a time sufficient to substantially hydrolyze the hydrolyzable acyclic ester by-products in said second reaction mixture, thereby forming an aqueous phase and an organic phase,

(b) separating the said organic phase and the aqueous phase, and

(c) heating the organic phase to remove the readily volatile components of the organic phase, thereby to produce 2-halomethyl-1,3-cyclic acetal of improved purity.

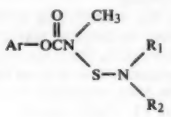
4,532,339

PROCESS FOR PURIFYING AMINOSULFENYLCARBAMATE DERIVATIVES

Hisashi Takao, Tokushima, Japan, assignor to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

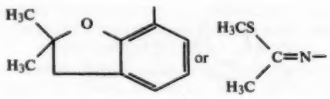
Filed Mar. 2, 1984, Ser. No. 585,462
Int. Cl.³ C07D *307/86;* **C07C** *161/00*
U.S. Cl. 549—470 **7 Claims**

1. A process for purifying an aminosulfenylcarbamate derivative represented by the formula (I)



[I]

wherein Ar is



and R^1 and R^2 are the same or different and are each C_{1-8} alkyl, C_{3-6} cycloalkyl, benzyl which is unsubstituted or substituted with halogen, C_{1-3} alkyl or C_{1-3} alkoxy, phenyl which is unsubstituted or substituted with halogen, C_{1-3} alkyl or C_{1-3} alkoxy, —X—$COOR^3$ or —Y—CN (in which X and Y are each straight-chain or branched-chain alkylene and R^3 is C_{1-8} alkyl or C_{3-6} cycloalkyl), R^1 and R^2, when taken together, represent a 5- or 6-membered heterocyclic ring which may contain a sulphur or oxygen atom, the process comprising bringing a solution of the unreacted carbamate-containing aminosulfenylcarbamate derivative of the formula (I) in a water-insoluble organic solvent into contact with an aqueous alkali solution or a mixture of alkali, water and a water-soluble organic solvent.

4,532,340

FUROCHROMONE INTERMEDIATES

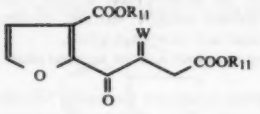
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 378,687, May 17, 1982, Pat. No. 4,434,296. This application Oct. 27, 1983, Ser. No. 545,988

Int. Cl.³ C07D *307/86, 307/54*

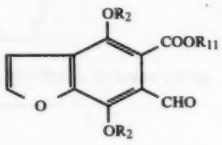
U.S. Cl. 549—471 **8 Claims**

1. A furochromone intermediate of formula I or II:



I

OR



II

wherein R_{11} is (C_1–C_4)alkyl;

wherein R_2 is hydrogen or C_1–C_4 alkyl; and

wherein W is α-H:β-H or =CH—NR_3R_4;

wherein R_3 and R_4, being the same or different, are C_1–C_4 alkyl.

4,532,341

OXIRANE COMPOUNDS

Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Berg-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlinger, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

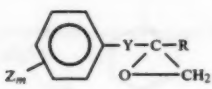
Continuation of Ser. No. 405,657, Aug. 5, 1982, abandoned, which is a division of Ser. No. 260,479, May 4, 1982, abandoned. This application Jun. 6, 1983, Ser. No. 499,679

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018866; Feb. 19, 1981, 3106076

Int. Cl.³ C07D *303/22*

U.S. Cl. 549—559 **6 Claims**

1. An oxirane compound of the formula



(II)

in which

R represents tert.-butyl, iso-propyl radical, cyclopropyl, substituted cyclopropyl, cyclopentyl or substituted cyclopentyl, cyclohexyl or substituted cyclohexyl, in each case the substituent being selected from methyl, or phenyl which is optionally mono- or di-substituted by identical or different substituents selected from fluorine, chlorine, methyl and trifluoromethyl,

Y represents a grouping —OCH_2—,

each Z is individually selected from the group consisting of a fluorine, chlorine or bromine atom, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl, phenoxy, benzyl and benzyloxy, said phenyl, phenoxy, benzyl and benzyloxy being optionally mono-or disubstituted by identical or different substituents selected from fluorine, chlorine and methyl,

m is 0, 1, 2 or 3.

4,532,342

N-SUBSTITUTED AMINO ACIDS AS INTERMEDIATES IN THE PREPARATION OF ACYL DERIVATIVES OF 1,2,3,4-TETRAHYDROISOQUINOLINE-3-CARBOXYLIC ACIDS

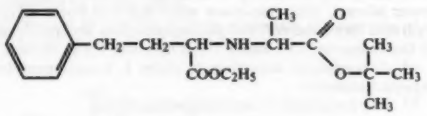
Milton L. Hoefle, and Sylvestor Klutchko, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 236,397, Feb. 20, 1981, Pat. No. 4,344,949, which is a continuation-in-part of Ser. No. 193,767, Oct. 3, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,375

Int. Cl.³ C07C *103/84*

U.S. Cl. 560—38 **3 Claims**

1. The N-substituted amino acid according to the formula



and salts thereof.

4,532,343

AROMATIC RETINOIC ACID ANALOGUES

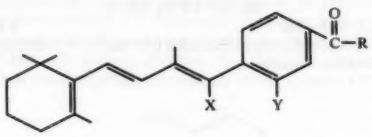
Marcia I. Dawson, Los Altos, and Peter D. Hobbs, Woodside, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Nov. 19, 1982, Ser. No. 443,118

Int. Cl.³ C07C *69/76*

U.S. Cl. 514—543 **13 Claims**

1. A compound of the formula:



where X is H or F, Y is H, F, Cl, hydroxy, methyl, ethyl, methoxy or ethoxy, and R is hydroxyl, alkoxy, aroxy, or NR^1R^2 where R^1 is hydrogen, alkyl, or aryl and R^2 is alkyl or aryl, with the proviso that when Y is H, X is F.

4,532,344

FLUORANTHENE DERIVATIVES

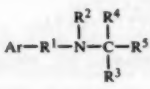
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 23, 1983, Ser. No. 496,853

Int. Cl.³ C07C *62/2*

U.S. Cl. 560—252 **19 Claims**

1. A compound of formula (I)



wherein

Ar is a fluoranthene ring system or a fluoranthene ring system substituted with halogen, C_{1-6} alkyl, C_{1-6} alkoxy,

C_{1-6} alkylthio, hydroxy, halo C_{1-6} alkyl, hydroxy C_{1-6} alkylthio, cyano, C_{1-6} alkylsulphinyl or C_{1-6} alkylsulphenyl;

R^1 is a C_{1-3} alkylene, p1 R^2 is hydrogen or a C_{1-6} alkyl,

R^3 is hydroxy C_{1-6} alkyl,

R^4 and R^5 are the same or different and are hydrogen, C_{1-6} alkyl or a C_{1-6} alkylcarboxylic acid ester derived therefrom or a pharmaceutically acceptable acid addition salt thereof.

4,532,345

PROCESS FOR PREPARING ARYLOXYALKYLPYRUVIC ACIDS

Joachim W. Wolfram, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 6, 1983, Ser. No. 529,570

Int. Cl.³ C07C *51/12*

U.S. Cl. 562—406 **16 Claims**

1. A process for the production of an aryloxyalkylpyruvic acid of the general formula:

$$(R)_n—A—O—(CR'_2)_m—CR''H—COCOOH$$

or a salt thereof wherein:

A represents a benzene or napthalene group,

R, R′ and R″ are the same or different, and are hydrogen or a linear or branched alkyl radical having up to 6 carbon atoms,

n is 0 or an integer from 1–5 when A is a benzene group, and n is 0 or an integer from 1–7 when A is a naphthalene group and m is 0–20, which comprises carbonylating an aryloxyalkyl halide of the general formula:

$$(R)_n13\ A—O—(CR'_2)_m—CR''H—X$$

where R, R′, R″, n, A and m are as defined above and X represents halogen in a liquid solvent medium, with carbon monoxide at elevated temperature and elevated pressure in the presence of a catalytic amount of a metal carbonyl compound and an alkali inorganic base or an alkaline earth metal inorganic base to form a salt of the aryloxyalkylpyruvic acid, and optionally then acidifying the salt to form said acid.

4,532,346

PROCESS FOR THE PREPARATION OF HYDROXYPHENOXY-ALKANECARBOXYLIC ACIDS

Karl Rehn, Hofheim am Taunus, and Hans J. Nestler, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

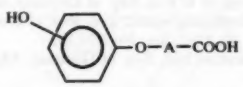
Filed Nov. 1, 1983, Ser. No. 547,744

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240805

Int. Cl.³ C07C *65/03*

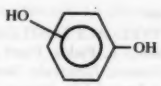
U.S. Cl. 562—471 **7 Claims**

1. In a process for the preparation of hydroxyphenoxyalkanecarboxylic acids of the formula



I

in which A is a methylene group optionally substituted by 1 to 2 alkyl groups having a total of up to 4 carbon atoms, comprising the reaction of a dihydroxybenzene of the formula



II

with a 2-haloalkanecarboxylic acid of the formula

$$Hal—A—COOH \qquad III$$

in which A is as defined above, or the halides or lower alkyl esters thereof, the improvement comprising mixing an aqueous alkaline solution of the dihydroxybenzene and the 2-haloalkanecarboxylic acid at a temperature below 60° C., and subsequently passing the aqueous-alkaline mixture of the dihydroxybenzene and 2-haloalkanecarboxylic acid continuously through a reaction tube at a temperature of 80° to 120° C.

4,532,347

MEMBRANE SOLVENT EXTRACTION PROCESS

Ronald J. Vaughan, Orinda, Calif., assignor to Varen Technology, Marshallton, Del.

Continuation-in-part of Ser. No. 929,004, Jul. 28, 1978, abandoned, which is a continuation of Ser. No. 479,161, Jun. 13, 1974, abandoned. This application Jan. 21, 1980, Ser. No. 114,379

Int. Cl.³ C01B *31/20*; C07C *51/27, 51/305, 51/31, 55/14, 127/15*; C07D *301/14*; C07J *1/00*

U.S. Cl. 562—528 **10 Claims**

1. In a process for membrane solvent extraction wherein a solute permeates through a polymeric membrane from a feed solvent liquid phase containing said solute to an extracting solvent liquid without direct contact betweeen the liquid phases which are separated by said membrane, the improvement which comprises maintaining a high concentration gradient for said solute across said membrane with an extracting solvent which has no greater solubility for the solute than said feed solvent by converting said solute permeating through said membrane to a different chemical compound by reacting the permeated solute with a reactant which is reactive with said solute but which is essentially non-reactive with said membrane and said solvents, thereby improving the separation of said solute from said feed solvent liquid phase.

4,532,348

1-(SUBSTITUTED PHENYLTHIOCARBAMYL) 3,3-DISUBSTITUTED FORMAMIDINES AND THEIR USE AS PHARMACEUTICAL AGENTS

Ferenc M. Pallos, Walnut Creek; Jack R. DeBaun, Sunnyvale, and Eugene G. Teach, El Cerrito, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 42,180, May 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 22,130, Mar. 20, 1979, abandoned. This application Jul. 16, 1980, Ser. No. 169,350

Int. Cl.³ C07C *157/09*

U.S. Cl. 564—27 **2 Claims**

1. The commpound having the structural formula

or salts thereof formed by combination with a suitable organic or inorganic acid.

4,532,349

2-AMINO-4'(PHENYLSULFONYL) ACETANILIDES

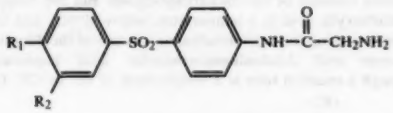
Stanley A. Lang, Jr., Blauvelt; Thomas L. Fields, Pearl River, both of N.Y.; Raymond G. Wilkinson, Montvale; Soon M. Kang, Dumont, both of N.J., and Yang-I Lin, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 411,399, Aug. 25, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 500,715

Int. Cl.³ C07D *103/183*

U.S. Cl. 564—194 **4 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, fluoro, chloro or bromo and R_2 is hydrogen or chloro with the proviso that at least one of R_1 and R_2 must be hydrogen but R_1 and R_2 may not both be hydrogen; and the pharmacologically acceptable acid-addition salts thereof.

4,532,350

PROCESS FOR THE SELECTIVE PREPARATION OF META-CHLOROANILINES

Georges Cordier, Francheville, and Pierre Fouilloux, Caluire, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

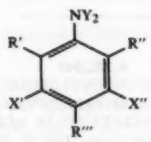
Continuation of Ser. No. 283,153, Jul. 14, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,887

Claims priority, application France, Aug. 1, 1980, 80 17325

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—412 **20 Claims**

1. A process for the preparation of anilines substituted in the meta-position by chlorine, by the catalytic hydrogenation, in the liquid phase, under the action of heat and under pressure, in the presence of noble metals from group VIII of the periodic classification, of nitrogen-containing and chlorine-containing benzene derivatives of the formula:



(I)

in which: Y represents the hydrogen atom or the oxygen atom, X′ and X″, which are identical to or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical, at least one of the symbols X′ and X″ necessarily being a chlorine atom and it furthermore being possible for one of the symbols X′ and X″ to be hydrogen, and R′, R″ and R‴, which are identical to or different from one another, each represent a chlorine atom or an optionally substituted alkyl, aralkyl, alkoxy or aryloxy radical, at least one of these three symbols representing the chlorine atom and it being furthermore possible for at most two of the symbols R′, R″ or R‴ to be hydrogen, in which process the reaction is carried out in the presence of a co-catalyst based on at least one heavy metal in solid metallic form belonging to one of the groups Ib to Va of the periodic classification.

4,532,351

PROCESS FOR HYDROGENATING ORGANIC COMPOUNDS BY USE OF GROUP VIII ALUMINUM-SILICATE CATALYSTS

Allan E. Barnett, and Albert P. Halluin, both of Westfield, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 16, 1982, Ser. No. 388,966

Int. Cl.³ C07C *85/11, 85/12*

U.S. Cl. 564—415 **24 Claims**

1. A process for hydrogenating organic compounds which process comprises contacting at least one hydrogenatable organic compound with hydrogen in the presence of a supported catalyst comprised of:

(a) one or more metals from Group VIII of the Periodic Table of the Elements,

(b) optionally, one or more metals selected from Group IB or IIA of the Periodic Table of the Elements,

(c) solid porous particles, and

(d) alumina and silica at a weight ratio of 0.45:1 to 1:0.45 respectively, exclusive of solid porous particles and based on the total weight of the catalyst after calcination,

said catalyst being characterized as having a B.E.T. total surface area ranging from about 150 to about 350 m^2/g, wherein the total amount of Group VIII metal in the catalyst ranges from about 10 wt. % to 70 wt. % and the total amount of the Group IB or Group IIA metal in the catalyst is up to 10 wt. %, wherein all weight percents are based on the total weight of the catalyst after calcination and reduction.

4,532,352

SEPARATION OF ANILINE AND P-FLUOROANILINE

Jerry R. Patton, Ellisville, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 24, 1983, Ser. No. 544,990

Int. Cl.³ C07C *85/26, 85/24*

U.S. Cl. 564—438 **14 Claims**

1. A process for the separation of p-fluoroaniline from a mixture containing p-fluoroaniline comprising:

(a) contacting said mixture with a mineral acid in the presence of an organic solvent to form an insoluble salt of p-fluoroaniline;

(b) isolating the insoluble salt of p-fluoroaniline from the reaction mixture.

4,532,353

SUBSTITUTED BENZOTRIFLUORIDE COMPOUNDS AS CHEMICAL INTERMEDIATES AND A PROCESS FOR THEIR PREPARATION

John P. Chupp, Kirkwood; Audrey Y. Ku, Chesterfield; Thomas E. Neumann, Maryland Heights, and Thomas E. Nickson, St. Charles, all of Mo., assignors to Monsanto Co., St. Louis, Mo.

Filed Jun. 16, 1983, Ser. No. 504,909

Int. Cl.³ C07C *87/60, 85/24, 85/11*

U.S. Cl. 564—442 **8 Claims**

4. The process of claim 1 wherein the compound of formula II is nitrated with a mixture of concentrated nitric acid and concentrated sulfuric acid.

4,532,354

METHOD FOR PURIFYING N,N-DIMETHYLAMINOPROPYLAMINE

Boy Cornils, Dinslaken; Ernst Wiebus, Oberhausen, and Norbert Breitkopf, Bottrop, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,742

Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120558

Int. Cl.³ C07C *85/26*

U.S. Cl. 564—498 **9 Claims**

1. A method for purifying N,N-dimethylaminopropylamine obtained by reacting dimethylamine and acrylonitrile to form a

first product; hydrogenating said first product to form a second product containing said N,N-dimethylaminopropylamine and, as a contaminent thereof, 1,3-diaminopropane; and distilling said second product; comprising

adding a compound of a transition metal to said second product in an amount of about 0.5 to about 20 moles per mole of said 1,3-diaminopropane contaminent either before or during said distillation step; and said distillation of said second product taking place in the presence of said compound.

4,532,355
SUBSTITUTED TRIARYL PHOSPHONIUM DERIVATIVES

Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

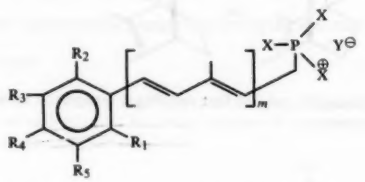
Division of Ser. No. 320,775, Nov. 12, 1981, which is a division of Ser. No. 173,517, Jul. 30, 1980, Pat. No. 4,319,048, which is a division of Ser. No. 037,270, May 9, 1979, Pat. No. 4,224,244, which is a division of Ser. No. 903,438, May 8, 1978, abandoned, which is a division of Ser. No. 714,170, Aug. 13, 1976, Pat. No. 4,105,681, which is a continuation-in-part of Ser. No. 601,148, Aug. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,007, Mar. 22, 1974, abandoned. This application Sep. 13, 1982, Ser. No. 417,013

Claims priority, application Switzerland, Mar. 30, 1973, 4603/73; Feb. 7, 1975, 1547/75

Int. Cl.³ C07F *9/54*

U.S. Cl. 568—9 **10 Claims**

1. A compound of the formula:



wherein m is an integer from 0 to 1: R_1 and R_2 are lower alkyl: R_3 is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, or nitro: R_4 is lower alkoxy and R_5 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy: X is aryl: and Y is an anion of an inorganic or organic acid.

4,532,356
CHEMICAL PROCESS

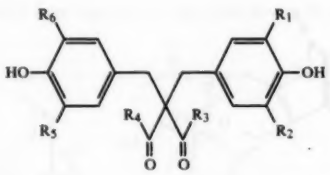
Charles R. Everly, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 16, 1983, Ser. No. 552,284

Int. Cl.³ C07C *45/61*

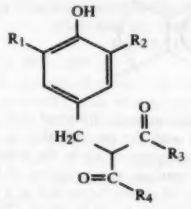
U.S. Cl. 568—315 **32 Claims**

1. A process for the preparation of bis(3',5'-mono or dihydrocarbyl-4'-hydroxybenzyl)-1,3-diketones having the general structural formula:



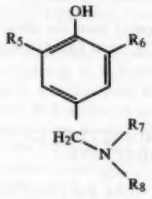
(IV)

which comprises reacting a (3',5'-mono or dihydrocarbyl-4'-hydroxybenzyl)-1,3-diketone of the general structural formula:



(I)

with an N,N-dihydrocarbyl-2,6-mono or dihydrocarbyl-4-aminomethylphenol of the general structural formula:



(II)

and an alkyl halide of the general formula

$$R_9X \qquad \text{(III)}$$

in the presence of an alkaline earth metal halide wherein R_1, R_2, R_5 and R_6, are the same or different and are hydrogen or hydrocarbyl radicals, with the provision that at least one of R_1 or R_2 and R_5 or R_6 must be other than hydrogen, R_3, R_4, R_7 and R_8 are the same or different and are hydrocarbyl radicals, and R_9 is a linear or branched alkyl radical having from 1 to about 20 carbon atoms and X is bromine, chlorine or iodine.

4,532,357
PROCESS FOR PRODUCING 1,1-DIMETHYL-3-INDANONES, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC USES THEREOF

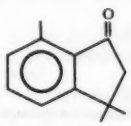
Augustinus G. van Loveren, Rye, N.Y.; Mark A. Sprecker, Sea Bright, N.J.; Patrick Whelan, Matawan, N.J., and Marie R. Hanna, Hazlet, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 24, 1984, Ser. No. 613,570

Int. Cl.³ C07C *49/15*; A61K *7/46*

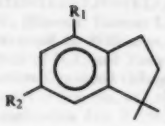
U.S. Cl. 568—327 **17 Claims**

1. The indanone having the structure:



in recovered form.

7. The product produced according to the process comprising the steps of (i) reacting the indane defined according to the structure:



wherein R_1 and R_2 are each the same or different and each represents hydrogen or methyl with the proviso that at least one of R_1 or R_2 is methyl, with oxygen or air in the presence of a transition metal oxidation catalyst at a pressure of from about 1 atmosphere up to about 10 atmospheres and at a temperature in the range of from about 25° C. up to about 150° C., and (ii) recovering a fractional distillation product from the reaction mixture with the provisos that:

(a) when one of R_1 and R_2 is methyl then the distillation product is recovered at 90°–92° C. and 115–120 mm/Hg pressure; and

(b) when both R_1 and R_2 are methyl then the distillation product is recovered at 96°–97° C. and 112–113 mm/Hg pressure.

4,532,358

PROCESS FOR THE MANUFACTURE OF 3-HYDROXY-2,6,6,-TRIMETHYL-2 CYCLOHEXEN-1-ONE

Teodor Lukàc, Aesch; Milan Soukup, Stein, and Erich Widmer, Münchenstein, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

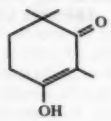
Filed Aug. 10, 1984, Ser. No. 639,544

Claims priority, application Switzerland, Aug. 23, 1983, 4593/83

Int. Cl.³ C07C *45/68*

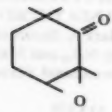
U.S. Cl. 568—341 **15 Claims**

1. A process for the manufacture of 3-hydroxy-2,6,6-trimethyl-2-cyclohexen-1-one of the formula



I

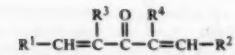
which process comprises isomerizing 1,3,3-trimethyl-7-oxabicyclo[4.1.0]heptan-2-one of the formula



II

in the presence of

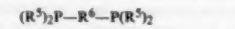
(a) a palladium(0) complex of an acetone derivative of the formula



III

wherein R^1 and R^2 are aryl and R^3 and R^4 are hydrogen or monovalent hydrocarbon groups optionally carrying a carbonyl function,

(b) a bis-(diphenylphosphino) derivative of the formula



IV

wherein R^5 is phenyl or tolyl and R^6 is a C_2–C_4-alkylene group optionally substituted with one or more inert organic groups, and

(c) a triarylphosphine of the formula

V

wherein R^7 is an optionally alkyl-substituted phenyl group.

4,532,359

1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]OCT-5-EN-2-OL, PROCESS FOR PRODUCING SAME, INTERMEDIATES USEFUL IN SAID PROCESS AND ORGANOLEPTIC USES OF SAME

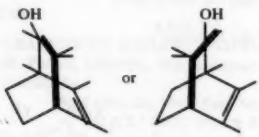
William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrancs Inc., New York, N.Y.

Division of Ser. No. 535,800, Sep. 26, 1983, Pat. No. 4,471,135, which is a division of Ser. No. 371,930, Apr. 26, 1982, Pat. No. 4,434,085. This application Apr. 20, 1984, Ser. No. 602,570

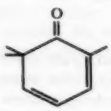
Int. Cl.³ C07C *45/61*

U.S. Cl. 568—346 **3 Claims**

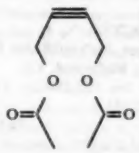
1. The process for preparing a compound having the structure:



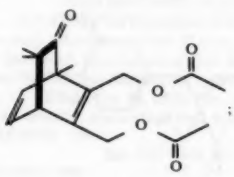
comprising the step of first reacting a compound having the structure:



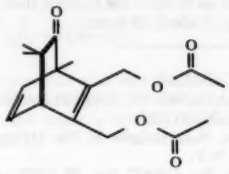
with a compound having the structure:



in order to form a compound having the structure:



then reacting the compound having the structure:



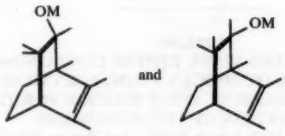
with hydrogen over a hydrogenation catalyst in order to form the compound having the structure:

the reacting the compound having the structure:

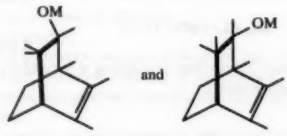
with the organometallic compound having the structure:

CH_3M

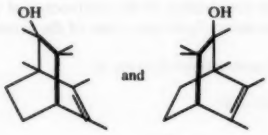
wherein M represents MgX or Li and X represents chloro, bromo or iodo in order to form a mixture of compounds defined according to the structures:



then hydrolyzing the mixture of compounds having the structures:



in order to form a mixture of compounds having the structures:



4,532,360

METHOD FOR PRODUCING KETONES AND PHENOLS

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 12, 1984, Ser. No. 570,106

Int. Cl.[3] **C07C** *45/33*

U.S. Cl. 568—357 **14 Claims**

1. A method of producing ketones and phenols from alkyl, aryl, cycloalkl, and alkaryl substituted benzenes comprising contacting said substituted benzenes with an oxidizing gas containing molecular oxygen in the presence of hydrogen bromide and at least one yield increasing and selectivity increasing compound, present in a yield increasing and selectivity increasing amount, of the group consisting of boron phosphate, triphenylborate, cerium oxide and water.

4,532,361

METHYL SUBSTITUTED-2-OXOHEXANE DERIVATIVES AND PROCESSES FOR PREPARING AND USING SAME

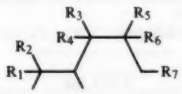
Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyckoff; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 497,670, May 24, 1983, which is a division of Ser. No. 345,665, Feb. 4, 1982, Pat. No. 4,421,679, which is a continuation-in-part of Ser. No. 195,630, Oct. 9, 1980, Pat. No. 4,335,009, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Jun. 13, 1984, Ser. No. 620,166

Int. Cl.[3] **C07C** *49/04*

U.S. Cl. 568—382 **5 Claims**

1. A methyl substituted-2-oxohexane derivative defined according to the structure:



wherein R_1 and R_2 can be taken together or are taken separately; and wherein R_1 and R_2 are taken together, R_1 and R_2 represent oxygen and wherein R_1 and R_2 are taken separately R_1 is hydroxyl and R_2 is methyl or R_1 is oxymagnesium halide and R_2 is methyl; and wherein R_3, R_4, R_5, R_6 and R_7 are the same or different hydrogen or methyl with the provisos that:

(i) the sum of the carbon atoms in R_3, R_4, R_5, R_6 and R_7 is three;

(ii) when R_7 is methyl, then R_5 and R_6 are each methyl; and

(iii) when R_7 is hydrogen, R_3 or R_4 is methyl.

4,532,362

OLEFIN OXIDATION CATALYST

Simon G. Kukes, and Tod K. Shioyama, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 364,360, Apr. 1, 1982, Pat. No. 4,448,892. This application Feb. 17, 1984, Ser. No. 581,401

Int. Cl.[3] **C07C** *45/34*

U.S. Cl. 568—401 **14 Claims**

1. In a process for the conversion of olefinic reactants to carbonyl compounds which comprises contacting

(a) at least one olefin with

(b) oxygen in

(c) a reaction diluent comprising at least two liquid phases wherein at least one phase is an aqueous phase and at least one phase is an organic phase, in the presence of

(d) a catalyst comprising (1) one or more suitable palladium components and (2) one or more suitable heteropolyacid or copper components, and

(e) one or more surfactants selected from the group consist-

ing of quaternary ammonium salts, alkali metal sulfates, alkali metal salts of alkanoic acids, alkali metal salts of alkaryl sulfuric acids, and 1-alkyl pyridinium salts, the improvement comprising including in said reaction diluent at least one fluorocarbon compound conforming to the formula

$$C_xF_yX_z$$

wherein X is a halogen other than fluorine and Y' is greater than X' and Y' is greater than Z', under such oxidation conditions sufficient to oxidize the olefinic carbon-carbon double bond of (a) to a carbonyl group.

4,532,363
PHENYLBUTYRALDEHYDES

Akiyoshi Ueda, Hiratsuka; Humiko Nagasaki, Oisomachi; Yutaka Takakura, and Shigeru Kojima, both of Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

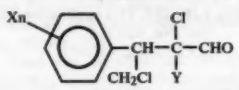
Division of Ser. No. 485,910, Apr. 18, 1983, Pat. No. 4,471,126. This application May 30, 1984, Ser. No. 615,328

Claims priority, application Japan, Apr. 26, 1982, 57-69847; Apr. 26, 1982, 57-69848

Int. Cl.³ C07C *47/228*

U.S. Cl. 568—424 **1 Claim**

1. A compound having the general formula



[II]

wherein

X is halogen, nitro or haloalkyl having 1 to 3 carbon atoms;

n is 0, 1 or 2; and

Y is hydrogen or halogen.

4,532,364
ETHER CARBOXALDEHYDES

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

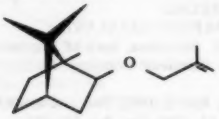
Continuation-in-part of Ser. No. 507,292, Jun. 23, 1983, abandoned. This application Sep. 19, 1983, Ser. No. 533,915

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

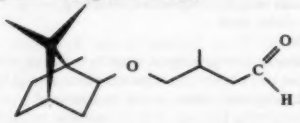
Int. Cl.³ C07C *45/50, 47/225*

U.S. Cl. 568—444 **2 Claims**

1. A product produced according to the process of reacting a mixture of carbon monoxide and hydrogen with an ether having the structure:



in the presence of an "oxo" reaction catalyst whereby a product is produced containing a mixture which mixture contains a compound having the structure:



the reaction being carried out at a temperature of between 150° C. and 300° C. and at a pressure of between 20 and 250 atmospheres with the ratio of partial pressure of carbon monoxide:-hydrogen being from 0.1:1 up to 1:0.1, the reaction time varying from about 2 hours up to about 30 hours.

4,532,365
CONVERSION OF ALKANES TO UNSATURATED ALDEHYDES

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 420,077, Sep. 20, 1982, , and a continuation-in-part of Ser. No. 368,196, Apr. 14, 1982, Pat. No. 4,413,147. This application Feb. 22, 1983, Ser. No. 468,524

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.³ C07C *45/34*

U.S. Cl. 568—479 **4 Claims**

1. A process for the preparation of unsaturated aldehyde from the corresponding alkane comprising:

(a) dehydrogenating the alkane to the corresponding olefin in the presence of steam, over a dehydrogenation catalyst comprising a Group VIII noble metal on a support at a temperature in the range of about 400°–700° C. and up to about 10 kg/cm² gauge pressure to form an effluent stream comprising the olefin, carbon oxides, hydrogen, steam, and unreacted alkane;

(b) mixing oxygen and optionally steam with said effluent stream of (a) and passing the mixture over a molybdenum-based oxidation catalyst at conditions selected to produce the unsaturated aldehyde and producing an effluent stream comprising the unsaturated aldehyde, unreacted alkane and olefin, oxygen, hydrogen, steam, and carbon oxides;

(c) recovering said aldehyde from said effluent of (b);

(d) separating from said effluent of (b) after recovery of unsaturated aldehyde therefrom the hydrogen produced in (a), the carbon oxides produced in (a) and (b), and the unreacted oxygen of (b); and

(e) returning as feed to (a) the effluent of (b) after recovering unsaturated aldehyde, hydrogen, oxygen, and carbon oxides therefrom.

4,532,366
PERFLUORINATED VINYL ETHERS CONTAINING A SECONDARY HYDROGEN ATOM, POLYMERS FORMED THEREFROM AND A PROCESS FOR THE PREPARATION OF THE MONOMERS

Günter Siegemund, Hofheim am Taunus, and Werner Schwertfeger, Langgöns, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

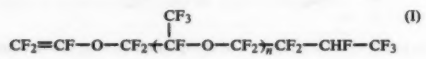
Filed Feb. 16, 1983, Ser. No. 467,178

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207143

Int. Cl.³ C07C *43/11*

U.S. Cl. 568—615 **9 Claims**

1. A perfluorinated vinyl ether containing a secondary hydrogen atom of the formula I



(I)

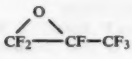
in which n is 0–5.

4. A process for the preparation of the perfluorinated vinyl ether containing a secondary hydrogen atom of the formula I of claim 1 by

(a) reacting 3-H-perfluorobutyryl fluoride II

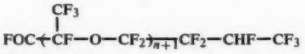
(II)

with hexafluoropropene epoxide (III)



(III)

in the presence of at least one ionic fluoride as catalyst and of an inert, aprotic-polar solvent, at temperatures between about −30° and about +100° C., to give the acid fluoride of the formula IV



(IV)

in which n is 0–5,

(b) pyrolyzing the acid fluoride IV, as such or after conversion into the corresponding alkali metal carboxylate, at temperatures between about 100° and about 600° C., and

(c) isolating the vinyl ether of the formula I formed in the pyrolysis.

4,532,367

ANTIMICROBIALLY EFFECTIVE DERIVATIVES OF PHENOL AND METHODS FOR THEIR PRODUCTION

Herbert Teubner, Wernigerode; Axel Kramer; Wolfgang Weuffen, both of Greifswald; Eberhard Schrötter, Rangsdorf, and Gerhard Grübel, Jena, all of German Democratic Rep., assignors to VEB Jenapharm, Jena, German Democratic Rep.

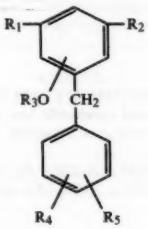
Filed Aug. 30, 1982, Ser. No. 412,851

Claims priority, application German Democratic Rep., Jul. 8, 1981, 2315622; Mar. 7, 1982, 2382118

Int. Cl.³ C07C *39/14*

U.S. Cl. 568—745 **6 Claims**

1. Phenol derivatives of the general Formula I



in which

R_1 is bromine or chlorine,

R_2 is methyl,

R_3 is hydrogen, sodium, potassium, calcium, barium, ammonium, by alkyl with up to 10 C-atoms substituted ammonium, magnesium, bismuth, tin, zinc, aluminum or copper, and

R_4 and R_5 are independently hydrogen, alkyl or alkoxy with up to 5 C-atoms, bromine or chlorine,

with the proviso that in no single compound is R_1 chlorine, R_2 methyl, and R_3, R_4 and R_5 hydrogen.

4,532,368

PROCESS FOR MAKING META- AND PARA-ALKYLPHENOLS

Barry J. Swanson, and Ronald L. Shubkin, both of Baton Rouge, La., assignors to Ethyl Corporation. Richmond, Va.

Filed Feb. 1, 1984, Ser. No. 575,757

Int. Cl.³ C07C *37/11*

U.S. Cl. 568—791 **20 Claims**

1. A process for making a mixture of meta- and para-alkylphenols containing only minor amounts of ortho-alkylphenol, said process comprising

(a) passing a mixture of phenol, ortho-alkylphenol, and an alkylating agent selected from the group consisting of lower alcohols and olefins, through a zeolite catalyst having a silica:alumina mole ratio of at least about 12:1 under alkylating conditions at a temperature of about 200°–500° C. to obtain a mixture of ortho-, meta- and para-alkylphenols,

(b) separating at least part of said ortho-alkylphenols from said mixture of ortho-, meta- and para-alkylphenols forming said mixture of meta- and para-alkylphenols containing only minor amounts of ortho-alkylphenols and

(c) recycling the separated ortho-alkylphenol to a subsequent alkylation carried out as defined in step (a), (b) and (c) wherein said separated ortho-alkylphenol is used as said ortho-alkylphenol in said mixture of phenol, ortho-alkylphenol and alkylating agent in step (a).

4,532,369

PROCESS FOR THE PREPARATION OF [2,2]-PARACYCLOPHANE

Hartmut Härtner, Mühltal, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,353

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240303

Int. Cl.³ C07C *2/72, 1/00*

U.S. Cl. 585—428 **9 Claims**

1. A process for preparing [2,2]-paracyclophane, comprising the step of contacting aqueous p-methylbenzyltrimethylammonium hydroxide with sodium hydroxide or potassium hydroxide, in the presence of dimethyl sulfoxide.

4,532,370

PROCESS FOR SYNTHESIZING 1-BUTENE BY DIMERIZATION OF ETHYLENE

Nhuong Lé Quan, Aubergenville; Daniel Cruypelinck, Nanteuil-le-Haudouin; Dominique Commereuc, Meudon; Yves Chauvin, Le Pecq, and Gérard Leger, Ecully, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 20, 1984, Ser. No. 652,555

Claims priority, application France, Sep. 20, 1983, 83 15040; Sep. 20, 1983, 83 15041

Int. Cl.³ C07C *3/21*

U.S. Cl. 585—512 **10 Claims**

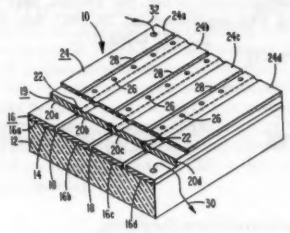
1. An improved process for converting ethylene to 1-butene wherein ethylene is contacted with a catalyst obtained by reacting an alkyl titanate with an alkylaluminum compound, characterized in that said catalyst results from reacting a preformed mixture of alkyl titanate and ether, in a molar ratio ether/titanate from 0.5:1 to 10:1, with an aluminum compound of formula AlR_3 or AlR_2H, wherein each R is a hydrocarbyl radical.

4,532,371

SERIES-CONNECTED PHOTOVOLTAIC ARRAY AND METHOD OF MAKING SAME

Joseph J. Hanak, Lawrenceville, and Gerald E. Nostrand, Plainsboro, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 12, 1984, Ser. No. 588,331
Claims priority, application United Kingdom, Nov. 16, 1983, 8330578
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—249 **14 Claims**



1. In a photovoltaic array comprising a plurality of series-connected photovoltaic cells, comprising a plurality of spaced apart electrically conducting segments, a continuous semiconductor body with a rectifying junction therein overlying said segments and a corresponding plurality of spaced apart electrically conducting regions overlying the body in opposing relation to said plurality of conducting segments, each cell comprising a conducting segment, the overlaying portion of the semiconductor body, and the corresponding conducting region;

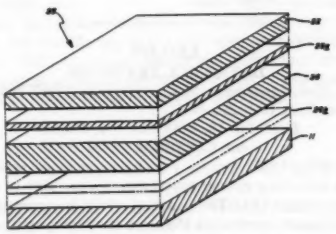
the improvement wherein the series connection between a first photovoltaic cell and an adjacent photovoltaic cell comprises a plurality of separate openings through the semiconductor body of the first cell with the conducting region of the adjacent cell extending into the openings and contacting the conducting segment of the first cell.

4,532,372

BARRIER LAYER FOR PHOTOVOLTAIC DEVICES

Prem Nath, Rochester, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 23, 1983, Ser. No. 564,862
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—256 **4 Claims**



1. In a semiconductor device comprising a first electrode; an active semiconductor body atop the first electrode, said semiconductor body adapted to provide for the flow of electrical current in response to light energy incident thereon; a second electrode atop the semiconductor body; and at least one defect region which is capable of providing a low resistance shunt path for the flow of electrical current between the electrodes; the improvement comprising:

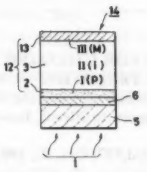
a continuous transparent barrier layer formed of a magnesium fluoride based material operatively disposed between the semiconductor body and one of the electrodes for decreasing the flow of electrical current through said at least one defect region of said semiconductor device.

4,532,373

AMORPHOUS PHOTOVOLTAIC SOLAR CELL

Hideharu Matsuura; Kazunobu Tanaka; Akihisa Matsuda; Hideyo Okushi; Hidetoshi Oheda; Satoshi Yamasaki, and Nobuhiro Hata, all of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade and Industry, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,324
Claims priority, application Japan, Mar. 23, 1983, 58-48301
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—258 **2 Claims**



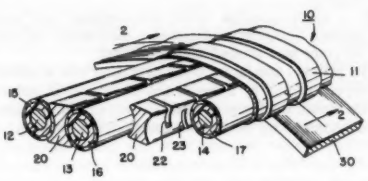
1. An amorphous photovoltaic energy conversion element for use in a solar cell, which comprises sequentially superposed first, second, and third layers, said first layer being formed of p-type material, said second layer being formed of an intrinsic amorphous semiconductor which has a potential gradient therein, and said third layer being formed of a metal which comes into ohmic contact with said second layer of intrinsic amorphous semiconductor and exhibits a work function lower than the work function of said second layer of intrinsic amorphous semiconductor.

4,532,374

ELECTRICAL CABLE FOR USE IN EXTREME ENVIRONMENTS

David H. Neuroth, Bethany, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Continuation-in-part of Ser. No. 447,969, Dec. 8, 1982,. This application Apr. 12, 1984, Ser. No. 599,650
Int. Cl.³ H01B *7/18*
U.S. Cl. 174—103 **14 Claims**



7. An electrical cable comprising:

a plurality of elongated, insulated conductors having a substantially concentric layer of electrical insulation covering each of said conductors, said conductors having substantially parallel longitudinal axes spaced laterlly from one another;

a jacket covering said conductors, said jacket being elongated in transverse cross-section and comprised of first

and second opposite edge portions and first and second opposite side portions, said side portions of said jacket having an arcuate shape in transverse cross-section; and

first and second force-resisting members within said jacket and positioned on opposite sides of one of said conductors, said members each having first, second and third legs, said third legs extending transversely across the jacket interior substantially from the first side portion to the second side portion, said first and second legs extending laterally from the third legs towards the center of the cable, each of the first and second legs being adjacent, respectively, the first side portion and the second side portion of the jacket and enclosing therebetween the surface of the insulation on said one conductor;

said third legs having lesser compressibility in transverse cross-section than said insulation on said one conductor,

each of said first legs being laterally wider in cross-section than each of said second legs, and

each of said first legs engaging one another and each of said second legs engaging one another to completely enclose said one conductor.

4,532,375

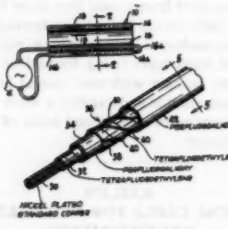
HEATING DEVICE FOR UTILIZING THE SKIN EFFECT OF ALTERNATING CURRENT

Harold B. Weitzel, Strongsville, and David G. Parman, Medina, both of Ohio, assignors to Ricwil, Incorporated, Brecksville, Ohio

Division of Ser. No. 313,937, Oct. 22, 1981, Pat. No. 4,436,565. This application Dec. 19, 1983, Ser. No. 563,165

Int. Cl.³ H01B 9/02

U.S. Cl. 174—107 **6 Claims**



4. A power cable capable of withstanding a continuous applied voltage of at least 3 kv and having a continuous operating temperature of at least 210° C., for use in a heating device including a heat tube, utilizing the skin effect of alternating current, comprising:

(a) a primary conductor comprising stranded, nickel plated copper;

(b) a semiconductor layer surrounding said conductor formed by spirally wrapping a carbonized, fluorocarbon polymer tape around said conductor;

(c) a primary insulation layer overlying said semiconductor layer, formed by an extruded fluorocarbon polymer, the minimum thickness of said primary insulation layer being determined by the application of the expression

[eq. 2]

$$S = \frac{KV\left(1 + \frac{D}{r_{oc}}\cos\theta\right)}{r \ln \frac{r_{oc}}{r_{ic}}}$$

to calculate the voltage stress in both the primary insulation layer and in the air surrounding said insulation layer where K is the dielectric constant which in calculating the maximum voltage stress in the insulation is taken to be 2.06 and in calculating the maximum voltage stress in the air is taken to be unity; V is an applied voltage of 3 kv; D is a displacement factor and is equal to the inner radius of the heat tube minus the radius of the cable; r_{oc} is the radius of the heat tube; r_{ic} is the radius of the conductor; and θ is equal to 0°.

4,532,376

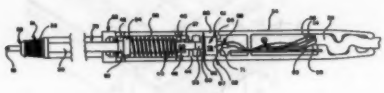
ELECTRONIC PEN WITH SWITCHING MECHANISM FOR SELECTIVELY PROVIDING TACTILE OR NON-TACTILE FEEL

Lynn H. Rockwell, Mesa, Ariz., assignor to Sanders Associates, Inc., Nashua, N.J.

Continuation-in-part of Ser. No. 498,602, May 26, 1983, abandoned. This application Jul. 29, 1983, Ser. No. 518,726

Int. Cl.³ G08B 5/22

U.S. Cl. 178—18 **8 Claims**



1. In an electronic pen comprising:

a housing having a wall with an aperture extending therethrough,

a cartridge including a pen tip extending through the aperture outwardly of the housing, the cartridge being movable within the housing between a first position in which the pen has a first status and a second position in which the pen has a second status,

status indication circuit means including switching means for providing a first status signal when the pen has its first status and a second status signal when the pen has its second status,

the improvement wherein the switching means comprises a normally-open switch including a stationary electrical contact connected to a first output lead, an electrically conductive, relatively thin convex dome mounted within the housing adjacent and generally surrounding one portion of the stationary electrical contact, and

deflection means responsive to movement of the carriage from the first position to the second position for snapping a first portion of the dome into a concave configuration into effective electrical contact with the stationary contact to close the normally-open switch and substantially simultaneously therewith to transmit a detectable mechanical snapping action to the housing, a second portion of the dome being connected to a second output lead and remaining stationary when the dome portion is being snapped into contact with the stationary contact, whereby switching operations occur without movement of the first or second output leads.

4,532,377

DATA CALL TRANSFER

John H. Zink, Manalapan, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jul. 18, 1983, Ser. No. 514,519

Int. Cl.³ H04M 11/00

U.S. Cl. 179—2 DP **18 Claims**

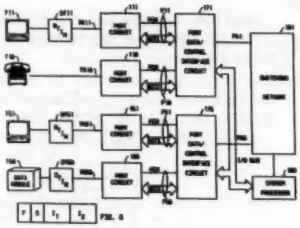
1. In a switching system which serves a plurality of communications circuits (T11-T58), each of which is connected by an associated port circuit (111-158) to a switching network (101) of said switching system, which switching network (101) establishes communications connections among said communications circuits (T11-T58) by interconnecting said associated port circuits (111-158), wherein one or more of said communications circuits (T18) are telephone station sets, each of which has associated therewith one or more of said communications circuits which are digital terminals (T11), said association including a designated button on said telephone station set

(T18) corresponding to each of said digital terminals (T11) associated with said telephone station set (T18), a data call transfer method comprising the steps of:

storing dialing signals output by any one of said telephone station sets (T18) in response to an initiation of a call at said telephone station set (T18); and

establishing in response to an operation of one of said designated buttons on said telephone station set (T18) a network connection between the one of said digital terminals (T11) associated with said operated designated button and a destination (T58) indicated by said dialing signals.

18. In a switching system which serves a plurality of network circuits (T11–T58), each of which is connected by an associated port circuit (111–158) to a switching network (101) of said switching system, which switching network (101) establishes network connections among said communications circuits (T11–T58) by interconnecting said associated port circuits (111–158), wherein one or more of said communications circuits are telephone station sets (T18), each of which has associated therewith one or more of said communications circuits which are digital terminals (T11), a data call transfer arrangement comprising:



system processor means (100) connected to said said switching network (101) and responsive to dialing signals output by any one of said telephone station sets (T18) on a call initiation for activating said switching network (101) to connect said telephone station set (T18) to the destination (T58) indicated by said dialing signals;

one or more button means on each of said telephone station sets (T18) corresponding on a one to one basis to said one or more associated digital terminals (T11);

control signalling means (S channel) connected to and interconnecting said telephone station set (T18) and said system processor (100) and responsive to the operation of one of said designated button means on said telephone station set (T18) for transmitting a call transfer signal indicative of said designated button operation to said system processor (100); and

wherein said system processor means (100) is responsive to said call transfer signal for activating said switching network (101) to connect one of said digital terminals (T11) associated with said one button means to said destination (T58) in place of said telephone station set (T18).

4,532,378

TELEPHONE APPARATUS CAPABLE OF INPUTTING CHARACTER DATA

Yasunobu Nakayama, Tustin, Calif.; Takeshi Kunii, and Yasuji Sato, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 378,730, May 17, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,343

Claims priority, application Japan, May 28, 1981, 56-80100

Int. Cl.[3] **H04M** *11/06*

U.S. Cl. 179—2 DP **4 Claims**

2. A telephone apparatus capable of inputting character/-symbol data comprising:

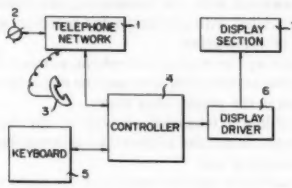
telephone network means connected to a handset and terminals connected to a telephone exchange station;

keyboard means having numeral keys each assigned to a plurality of characters/symbols, and a mode switching key for switching between a numeral mode and a character/symbol mode, said keyboard means including a single key having a switching instruction function which switches, with each depression, a character/symbol being displayed in a character/symbol mode to a different character/symbol associated with the same numeral key; and

controller means connected to the telephone network means and the keyboard, said controller means for: (1) setting a desired mode as the mode switching key is operated, (2) selecting for entry one of the characters/symbols assigned to one of said numeral keys which has been depressed after the mode setting means has been set to the character/symbol mode, and (3) changing the character/symbol selected for entry in said function (2) to a different character/symbol associated with the same numeral key in response to each repeated depression of said single switching instruction function key.

3. A telephone apparatus capable of inputting character/-symbol data comprising:

telephone network means connected to a handset and terminals connected to a telephone exchange station;



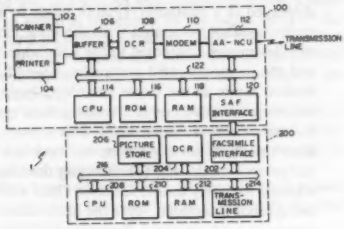
keyboard means having numeral keys each assigned to a plurality of characters/symbols and a mode switching key for switching between a numeral mode and a character/-symbol mode, said keyboard means including a key having a switching instruction function which causes preparation for an additional character/symbol to be displayed with the next depression of one of said numeral keys; and

controller means connected to the telephone network means and the keyboard, said controller means for: (1) setting a desired mode as the mode switching key is operated, (2) selecting for entry one of the character/symbols assigned to one of said numeral keys which has been depressed after said mode setting means has been set to the character/symbol mode, (3) changing the character/symbol selected for entry in said function (2) to a different character/symbol associated with the same numeral key in response to each repeated depression of the same numeral key previously depressed, (4) selecting for entry one of the characters/symbols assigned to another of said numeral keys which has been depressed immediately after said one numeral key, and (5) preparing for an additional character/symbol to be entered with the next depression of one of said numeral keys in response to depression of said switching instruction function key when said additional character/symbol is associated with the same one of said numeral keys as the character/symbol just entered.

4,532,379
FACSIMILE RELAYING METHOD

Yasunori Tsukioka, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,197
Claims priority, application Japan, Apr. 6, 1983, 58-59195
Int. Cl.[3] H04M *11/00*
U.S. Cl. 179—2 R 7 Claims



2. A facsimile relaying method which, using a facsimile relaying apparatus equipped with a telephone number data store, a picture data store and a central processing unit, sequentially transmits common picture information to a plurality of designated facsimile receivers for a facsimile transmitter, said facsimile relaying method comprising the steps of:

(a) receiving from the transmitter telephone number data associated with the transmitter, telephone number data associated with the designated receivers and picture data to be transmitted;

(b) storing the received telephone number data in the telephone number data store and the received transmit picture data in the picture data store;

(c) reading a telephone number of the transmitter and a telephone number of the relaying apparatus by the central processing unit;

(d) reading a telephone number of one of the receivers by the central processing unit;

(e) determining whether a toll number is included in the telephone number of the receiver;

(f) determining, when a toll number is found in step (d), whether the toll number is identical with a toll number of the relaying apparatus;

(g) determining, if the toll numbers are identical in step (f), whether a local office number and a subscriber's number of the receiver are identical with a local office number and a subscriber's number of the relaying apparatus; and

(h) reading the picture data by the central processing unit to print out the picture data when the local office numbers and the subscriber's numbers are individually identical at step (g).

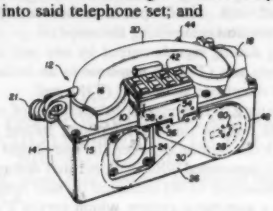
4,532,380
TONE SIGNALLING ADAPTER FOR A TELEPHONE SET

Salvatore A. Romano, Jr., Staten Island, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1984, Ser. No. 608,824
Int. Cl.[3] H04M *1/30*
U.S. Cl. 179—2 C 18 Claims

1. A telephone dialing adapter for a ring-down telephone set, comprising,

dialing apparatus mechanically and electrically attachable to said telephone set and including means for coupling dialing signals into said telephone set; and

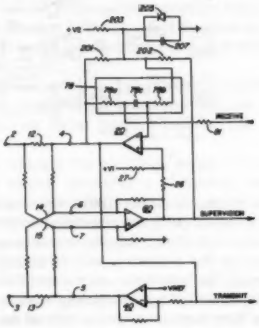


means integral with said dialing apparatus for selectively preventing the generation of ring signals when attached to said telephone set.

4,532,381
ACTIVE IMPEDANCE LINE FEED CIRCUIT

Stanley D. Rosenbaum, Ottawa, and Zdenek Holy, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 13, 1984, Ser. No. 579,266
Int. Cl.[3] H04M *19/00*; H04B *3/00*
U.S. Cl. 179—18 FA 7 Claims



1. An active impedance line feed circuit for supplying energizing direct current and alternating current signals to a pair of leads in a communication line comprising:

a pair of tip and ring line terminals for connection to the communication line;

a receive signal terminal for receiving a.c. signal information destined for the communication line;

tip and ring amplifiers each having an output for conducting tip and ring currents respectively;

a resistance network including tip and ring feed resistors being of similar ohmic values, the tip feed resistor being connected in series with the output of the tip amplifier and the tip terminal, and the ring feed resistor being connected in series with the output of the ring amplifier and the ring terminal, and tip and ring voltage dividers defining tip and ring voltage taps respectively;

a control circuit having an output and having a differential input being connected across the tip and ring voltage taps;

in combination with one of the tip and ring amplifiers;

a first resistive signal path being connected between the output of the control circuit and a non-inverting input of the amplifier;

an a.c. feedback network being connected between the output of the amplifier and an inverting input of the amplifier;

a d.c. feed control network comprising first and second resistors being connected in series between the output of the amplifier and the output of the control circuit and

defining a junction therebetween, a unidirectional conductive device connected to the junction for preventing a potential of the junction from being less than a predetermined voltage, the junction being a.c. grounded via a capacitive element and being resistively connected to a bias voltage source of a potential greater than the predetermined potential and being resistively connected to the inverting input of the amplifier;

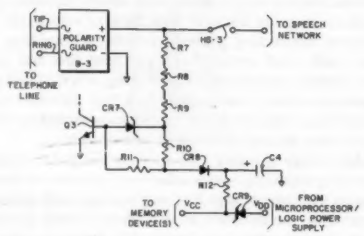
the second resistor and the junction comprising part of a second resistive signal path which in combination with the first resistive signal path, couple signals of frequencies below voice band frequencies and including direct current are applied in common mode configuration across the inputs of the amplifier in an instant of the unidirectional conductive device being non conductive.

4,532,382

POWER SUPPLY FOR TELEPHONE EQUIPMENT MEMORY DEVICES

Karl E. Pommer, II, Los Alamos, N. Mex., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jan. 30, 1984, Ser. No. 575,369
Int. Cl.³ H04M *1/00, 1/274*
U.S. Cl. 179—81 R **10 Claims**



1. In combination, a substation telephone including connections via a telephone line, to a source of battery located at a central switching point, said telephone including a low voltage power supply, at least one memory device and a power supply for said memory device comprising:

a first input including voltage dropping means and voltage limiting means connected in series across said telephone line and voltage dividing means connected across a portion of said voltage limiting means to derive a voltage from said battery source located at said central switching point;

energy storage means;

first unidirectional conducting means connecting said voltage limiting means to said energy storage means;

a second input including second unidirectional conducting means connecting said low voltage supply to said memory device power supply output; and

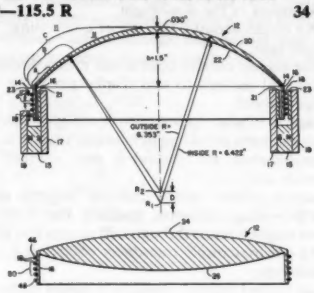
a decoupling means connected between said energy storage means and said second unidirectional conducting means also providing a circuit connection from said first unidirectional conducting means to said memory device power supply output, whereby voltage for operation of said memory device may be derived from said telephone line, from said low voltage power supply, or from voltage stored in said energy storage means.

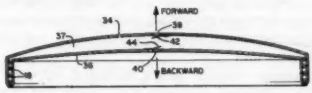
4,532,383

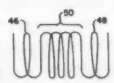
ELECTROACOUSTIC TRANSDUCER HAVING A VARIABLE THICKNESS DIAPHRAGM

Erazm A. Willy, 128 Country Manor Way, Apartment 7, Webster, N.Y. 14580

Filed Jan. 4, 1980, Ser. No. 109,500
Int. Cl.³ H04R *7/02, 7/12, 9/02, 9/06*
U.S. Cl. 179—115.5 R **34 Claims**







1. A diaphragm for use in a peripheral drive electroacoustic transducer for responding to a range of frequencies from a predetermined low frequency to a predetermined high frequency, said diaphragm having first and second surfaces facing in opposite directions wherein the diaphragm has a variable thickness with the thinnest portion of the diaphragm being along the peripheral edge thereof and the thickness gradually increasing to a point of maximum thickness located in a portion of the diaphragm other than at the peripheral edge thereof, wherein the thicknesses of respective portions of the diaphragm are set so that only a ring portion of the diaphragm adjacent to the peripheral edge thereof will respond to high frequencies in said frequency range while a central portion of said diaphragm within said ring portion remains static at said high frequencies.

16. A current conducting coil wound on a core which is secured to a diaphragm of an electroacoustic transducer wherein said coil comprises a plurality of windings including outer winding sections at each end of the coil and an inner winding section between the outer winding sections, wherein the winding direction of the windings in the outer winding sections is opposite to the winding direction of the windings in the inner winding section to provide a negative feedback electromagnetic field by said outer winding section relative to the electromagnetic field produced by said inner winding section to reduce movement of said current conduction means along the peripheral edge of the diaphragm when current passes through said current conduction means.

21. A diaphragm comprising:

first and second sheets joined together substantially at their peripheries to form an air-tight seal along the periphery of the diaphragm with an internal space between inner facing

surfaces of the first and second sheets and the air-tight seal along the diaphragm periphery;
a first opening in the first sheet;
a second opening in the second sheet; and
first and second cover layers respectively located on the inner surfaces of the first and second layers over the first and second openings to uncover the openings during movement of the diaphragm.

33. An electroacoustic transducer comprising:
a diaphragm;
tubular shaped current conduction means comprising a Litz wire coil secured to said diaphragm along a peripheral edge thereof;
concentric tubular shaped open ended magnetic flux translative elements providing at least one tubular shaped air gap therebetween for receiving said current conduction means; and
permanent magnet means mounted between said elements for providing concentric magnetic flux from said permanent magnet means through said air gap and said elements.

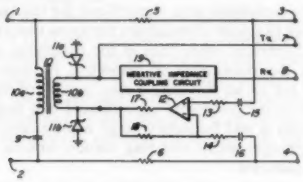
34. An electroacoustic transducer comprising:
a diaphragm;
tubular shaped current conduction means comprising a coil with windings spaced apart from one another by a distance D approximately equal to the thickness of the windings secured to said diaphragm along a peripheral edge thereof;
concentric tubular shaped open ended magnetic flux translative elements providing at least one tubular shaped air gap therebetween for receiving said current conduction means; and
permanent magnet means mounted between said elements for providing concentric magnetic flux from said permanent magnet means through said air gap and said elements,
wherein the distance D is set to reduce the capacitance between the windings during operation of the diaphragm.

4,532,384

LINE FEED CIRCUIT INCLUDING NEGATIVE IMPEDANCE CIRCUIT

Magdy H. Keriakos, Kanata, and Stanley D. Rosenbaum, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 4, 1983, Ser. No. 464,032
Int. Cl.³ H04B *3/16*
U.S. Cl. 179—170 G **12 Claims**



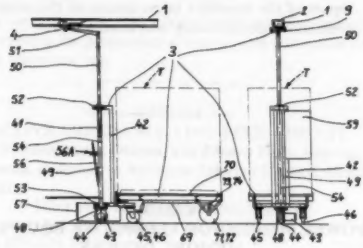
1. A line feed circuit for terminating a two wire communication line comprising:
tip and ring terminals for connection to the communication line;
a pair of power terminals for connection across a power source;
tip and ring resistors being connected between respective ones of the tip and ring terminals and the power terminals;
a negative impedance coupling circuit having an impedance port including a negative impedance node, and having an input node for receiving a.c. signals for coupling to the two wire communication line via the negative impedance node;
a direct current blocking means;
a transformer having first and second windings in combination with a core structure, the first winding and the direct current blocking means being connected in series between the tip and ring terminals, and the second winding being connected to the impedance port.

4,532,385

LOAD TRANSPORTING DEVICE AND ELECTRIC SUPPLY TRACK THEREFOR

Wolf Friske, Malsch, Fed. Rep. of Germany, assignor to Eduard Angele, Malsch, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,721
Int. Cl.³ B60M *1/34*; B60L *5/40*; E01B *25/26*; B61B *13/00*
U.S. Cl. 191—23 A **19 Claims**



1. A load transporting device for carrying loads, comprising:
a wheel supported load transport carriage adapted to travel along a floor surface;
overhead electric supply guide track means including plural sections of guide track, at least three of said guide track sections intersecting at means defining a branching, each said guide track section having at least first and second guide means thereon at said branching, a first of said guide means extending continuously in a first direction at said branching, a second of said guide means extending continuously in a second direction at said branching;
a guide carriage movably supported on said guide track and including adjusting means selectively operatively coupleable to only one of said first and second guide means for controlling the direction of movement of said guide carriage through said branching while simultaneously becoming disconnected from the other of said first and second guide means, said guide carriage having plural support rollers, two pairs of guide rollers, each of which engage an inner surface of said guide track means, and two further guide roller pairs, each of which are mounted on said adjusting means and selectively engage selected ones of said first and second guide means, said adjusting means comprising a two arm lever which is hingedly supported on said guide carriage for movement between first and second positions, one guide roller pair being mounted on one arm and movable into and out of operative engagement with said first guide means whereas the other guide roller pair is mounted on the other arm and is movable into operative engagement with said second guide means when said one guide roller pair moves out of engagement with said first guide means and vice versa;
steerable means on said transport carriage for facilitating a change in direction of movement of said transport carriage along said floor surface;
coupling means for coupling said guide carriage to said steerable means and for causing said transport carriage and said guide carriage to travel in the same direction;
controllable drive means powered from the electric supply of said guide track means for effecting a driving movement of said transport carriage along said floor surface and a movement of said guide carriage along said guide track means;

biassing means provided for continually urging said two arm lever from said first position thereof;

releasable locking means provided for holding said two arm lever in said first position; and

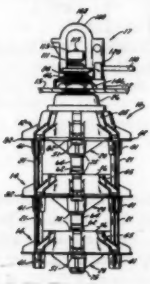
cooperating cam means for effecting a release of said locking means so that said lever arm will move under the urging of said biassing means toward said second position to cause said guide roller pair on said one arm to move away from said first guide means as said other guide roller pair will move toward said second guide means, said first position being achieved again by a ramp roller mounted on said one arm engaging an inclined ramp mounted on said guide track and thereby during a forward travel moving said two arm lever of said adjusting means against the urging of said biassing means until said two arm lever is again in said first position to again be held by said locking means.

4,532,386

DUAL VOLTAGE SWITCH

Frank J. Muench, Jr., Waukesha, and John M. Makal, Milwaukee, both of Wis., assignors to RTE Corporation, Waukesha, Wis.

Filed Oct. 5, 1983, Ser. No. 539,204
Int. Cl.³ H01H *19/58*
U.S. Cl. 200—11 TC **19 Claims**



16.A switch unit for a dual voltage under oil transformer switch,

said unit comprising a switch block having a central bore and a contact deck,

a number of electrical contact blades mounted on said deck in a common plane at equally spaced intervals,

a rotor positioned within said switch block, a shaft supporting said rotor for rotary motion in said switch block,

contact means mounted on said rotor for interconnecting said contact blades on said deck in a first predetermined relation in one position and in a second predetermined relation in a second position, said contact means including a number of electrically conductive bridge contacts, each bridge contact including at least two fingers located at spaced intervals slightly greater than said intervals between said contact blades whereby said bridge contacts will operatively engage said contact blades in sequence on rotation of said rotor, an operating handle connected to said shaft for rotating said rotor in said switch block and an index member mounted on said switch block for positively locating said rotor with respect to said switch block.

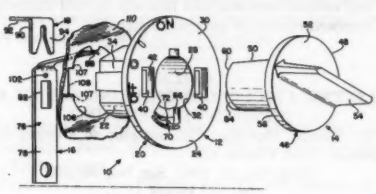
4,532,387

TWO-POSITION ROTARY SWITCH ASSEMBLY

Frank V. Pliml, Jr., Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 3, 1984, Ser. No. 576,600
Int. Cl.³ H01H *19/36*
U.S. Cl. 200—11 R **12 Claims**

1. A two-position rotary switch assembly comprising a mounting member and switching member, said mounting member including an electrically non-conducting body having a head portion with a central opening and a shank portion with a throughbore in axial alignment with said central opening, said switching member including an electrically non-conducting rotary part having a knob portion and a generally cylindrical-shaped shaft portion of a diameter slightly smaller than the diameter of said throughbore, said knob portion including a flange integrally formed in normal relation to said shaft portion and having its undersurface slidingly engage said head portion of said mounting member, stop means for limiting the rotational motion of said switching member relative to said mounting member between first and second positions, catch means for releasably holding said switching member in one of said first and second positions, and an electrical contact means mounted on said shaft portion and includes at least one arm portion, a recess extending from the free end of said shaft portion inwardly of its peripheral surface, said at least one arm portion disposed in said recess, and a slot formed through said shank portion at a location which is in direct alignment with said recess of said shaft portion upon said switching member being moved to one of said first and said second positions.

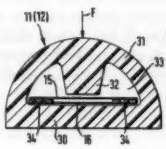


4,532,388

ELONGATE RESILIENT SECTION AT THE CLOSURE EDGE OF A CLOSURE

Karl H. Sackmann, and Christoph Anselment, both of Waldkirch, Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,538
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232365; Apr. 5, 1983, 3312223
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.43 **12 Claims**



1. A composite elongate resilient section for mounting in a rail at the edge of a closure member movable to close an opening, comprising:

first and second longitudinally extending elongate hollow cavities in said elongate resilient section on opposite sides of a central longitudinal plane thereof, and said elongate resilient section further having an elgonate, undercut, securing block adapted to engage said rail;

a resilient switching strip disposed in each said elongate hollow cavity, each said resilient strip comprising first and second confronting resilient contact bands, a spacer disposed between said first and secodd contact bands along each longitudinal edge therof to maintain said contact bands in spaced apart relationship, and an extruded synthetic hollow section surrounding said contact bands and

said spacers, said extruded synthetic hollow section having a flat base by which it is secured to the inside of the respective one of said first and second hollow cavities adjacent to said securing block and an outwardly curving wall opposing said flat base; and

first and second actuating webs in said elongate resilient section, each said web sufficiently close to one said curving wall, whereby upon distortion of said elongate resilient section at least one of said webs is urged toward said curving wall, causing compression of said hollow section and contact between said first and second contact bands disposed therein to generate a signal.

4,532,389

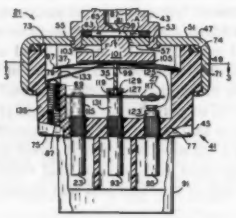
ELECTRIC CIRCUIT CONTROLLING DEVICE AND METHOD OF OPERATING

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 17, 1983, Ser. No. 505,493

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 P **29 Claims**



22. A method of operating an electric circuit controlling device having a fulcrum, and means for pivotally mounting a switch member with the switch member including a pair of spaced apart switch elements each having a free end portion and operable generally between a pair of circuit controlling modes, respectively, the method comprising the steps of:

moving one of the switch elements generally about the pivotally mounting means of the switch member and abutting the one switch element with the fulcrum;

pivoting the one switch element generally about its abutment with the fulcrum and urging thereby the free end portion of the one switch element toward one of the circuit controlling modes thereof; and thereafter

moving the other of the switch elements independently of the one switch element and generally about the pivotally mounting means of the switch member and urging thereby the free end portion of the other switch element toward one of the circuit controlling modes thereof.

24. An electric circuit controlling device comprising:

a housing;

a pair of means movable in said housing and operable generally for switching between at least a pair of circuit controlling modes, respectively;

actuating means arranged in bridging pivotal engagement between at least said switching means and pivotally movable in response to an applied force exerted thereon for effecting the operation of said switching means, respectively, said actuating means being pivotally movable upon the exertion thereon of the applied force at a preselected level to effect the operation of one of said switching means into one of the circuit controlling modes thereof, and said actuating means being thereafter further pivotally movable with respect to said one switching means in the one circuit controlling mode thereof upon the exertion on said actuating means of the applied force at another preselected level in excess of the first named preselected level to effect the operation of the other of said switching means toward one of the circuit controlling modes thereof.

4,532,390

DIAPHRAGM PRESSURE SWITCH FOR CONTROLLING SMALL PRESSURE GRADIENTS

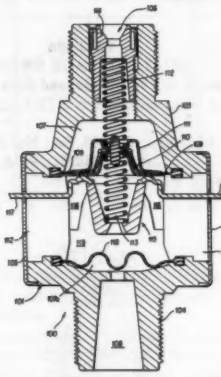
Cesare Gallone, Cornaredo, Italy, assignor to Signal Lux S.p.A., Milan, Italy

Filed Nov. 14, 1983, Ser. No. 551,682

Claims priority, application Italy, Nov. 17, 1982, 24290 A/82; May 30, 1983, 21996/83[U]

Int. Cl.³ H01H *35/40*

U.S. Cl. 200—83 B **13 Claims**



1. A diaphragm pressure switch for controlling small pressure gradients comprising, in a containing body communicating with the outside by means of channels: a diaphragm subject to elastic deformation, supported at its edges by said body and separating said channels from each other, at least a small disc made of electrically conductive material cooperatingly engaging a portion of one of the faces of said diaphragm, and electrical contacts supported by said body and disposed adjacent said small disc, characterized in that said diaphragm is provided with a working portion disposed outwardly from the periphery of said small disc and presenting a thin thickness, and in that means for supporting said diaphragm are provided and positioned in proximity to the working portion of the diaphragm and near one of the faces thereof and outwardly from the periphery of the small disc, the diaphragm supporting means being provided for preventing irregular deformations of said working portion.

4,532,391

CONTACT ARRANGEMENT FOR VACUUM SWITCHES

Paul Bernt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,500

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231593

Int. Cl.³ H01H *33/66*

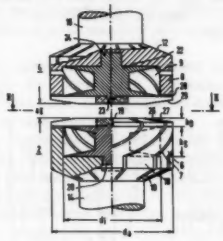
U.S. Cl. 200—144 B **11 Claims**

1. In a hollow contact arrangement for use in a vacuum switch, comprising a pair of hollow contacts, each capable of generating an axial field, arranged coaxially with respect to each other, said hollow contacts each comprising: a contact carrier having a cylindrical recess at its outer end, said contact carrier provided with inclined slots, all of said slots inclined in the same direction; a contact disc with its edge region resting on the outer end of the contact carrier; and a central support body disposed within said hollow portion extending between

said contact carrier and said contact disc, the improvement comprising:

(a) said support bodies:

(i) being bodies of rotation having their ends facing the contact discs enlarged;



(ii) consisting of a poorly conducting material; and

(iii) being connected in a positively locking manner to said contact disc; and

(b) the slots in both contact carriers being inclined in the same direction.

4,532,392

ROTATING ARC ELECTRIC CIRCUIT BREAKER

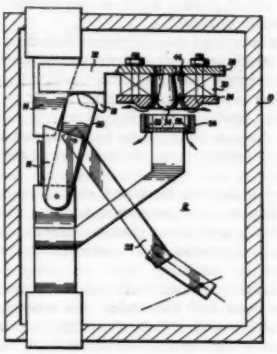
Olivier Bouillez, Seyssins, and Michel Imbert, Crolles, both of France, assignors to Merlin Gerin, France

Filed Jul. 26, 1983, Ser. No. 517,261

Claims priority, application France, Aug. 10, 1982, 82 14032

Int. Cl.³ H01H *33/18, 33/60, 33/12, 33/98*

U.S. Cl. 200—147 R **6 Claims**



1. An electric circuit breaker with self blow-out by rotation of an arc under the effect of a magnetic field generated by the current to be cut, said electric circuit breaker comprising:

a sealed chamber filled with an insulating gas of high dielectric strength;

a stationary contact assembly mounted inside said sealed chamber, said stationary contact assembly having a front zone and an opposite rear zone;

a first annular electrode associated with said stationary contact assembly, said first annular electrode having a front side and a rear side, said first annular electrode forming an annular track for the rotation of the arc under the effect of a magnetic field generated by a tubular coil fitted coaxially at the rear side of said annular electrode;

a ferromagnetic core extending coaxially inside said tubular coil and presenting a terminal face adjacent to said first annular electrode;

a channel extending axially through said tubular coil and first annular electrode of said stationary contact assembly, said channel extending between the front zone and the opposite rear zone of said stationary contact assembly; and

an arc expansion zone arranged at said front zone of the stationary contact assembly and communicating freely with said opposite rear zone, said communication between the arc expansion zone and the opposite rear zone being both inside and outside said stationary contact assembly so as to define a first trajectory for ionized gas passing through said channel inside said stationary contact assembly, and a second trajectory passing outside said stationary contact assembly between said stationary contact assembly and an inner wall of said chamber.

4,532,393

PUSH BUTTON SWITCH

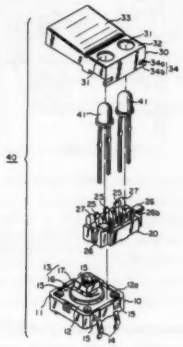
Haruyuki Koizumi; Zenichi Kitao, and Hideki Sato, all of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics, Co., Kyoto, Japan

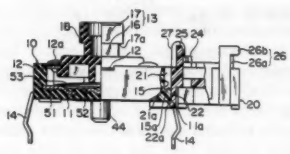
Continuation of Ser. No. 518,046, Jul. 28, 1983, abandoned. This application May 25, 1984, Ser. No. 614,388

Claims priority, application Japan, Jul. 30, 1982, 57-116385[U]

Int. Cl.³ H01H *13/52, 9/18*

U.S. Cl. 200—159 R **6 Claims**





1. A push button switch assembly comprising a switching body having a push button actuating a switching mechanism therein, a holder located at one end wall of said switching body, and a key top swingably supported by the holder for actuating said push button,

said switching body having a means for engaging said holder on an end wall thereof,

said holder having at first means for engaging on an end wall of said switching body and a second means for engaging said key top on an opposite end wall thereof,

wherein said switching body and said holder are located side-by-side during engagement,

said key top on an end wall thereof including an engaging portion to be removably and swingably engaged with said second engaging portion of the holder, and

wherein said holder second means for engaging engages said key top engaging portion and wherein said key top lies above said switching body and said holder.

4,532,394

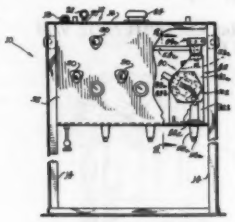
SWITCH APPARATUS

James W. Fox, Orland Park; Ronald J. Moery, Tinely Park, both of Ill., and Kenneth P. Banas, Munster, Ind., assignors to G & W Electric Company, Blue Island, Ill.

Continuation of Ser. No. 440,612, Nov. 10, 1982, Pat. No. 4,467,161. This application Jan. 30, 1984, Ser. No. 574,919

Int. Cl.³ H01H *1/06*

U.S. Cl. 200—275 **1 Claim**



1. In a switch assembly including at least two power terminals enabling connection of the switch assembly in an electric circuit, at least one electrically conductive contact blade connected to a selected one of said power terminals, at least one conductive contact electrically connected to the other of said terminals, and operator means operatively associated with said conductive contact blade and operative to move said contact blade between a first position spaced from said conductive contact and second position wherein said contact blade is electrically connected to said conductive contact; the improvement wherein said contact blade comprises a length of flexible stranded electrical conductor cable, a first conductive sleeve coaxial over one end of said conductor cable and formed thereto so as to define an elongated electrically conductive contact blade end of substantially solid transverse cross section, said substantially solid end being formed by deformation of said strands, and a second conductive sleeve coaxial over the opposite end of said conductor cable and formed thereto so as to define an electrically conductive connector end of substantially solid transverse cross section, said first conductive sleeve and associated blade end of said conductor cable having a plurality of transverse cylindrical bores therein to enable mounting on said operator means for movement between said first and second positions, and said second conductive sleeve and associated connector end of said conductor cable being adapted for relatively fixed electrical connection to said selected one of said terminals, said first conductive sleeve and associated blade end having substantially planar side surfaces interconnected by rounded longitudinal edge surfaces, and having an elongated, non-perforated end portion.

4,532,395

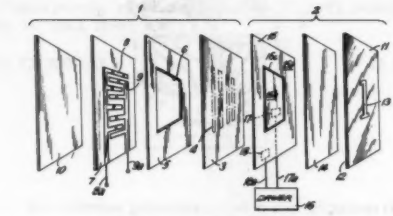
ELECTROLUMINESCENT FLEXIBLE TOUCH SWITCH PANEL

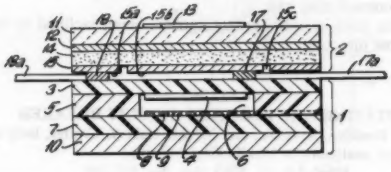
Raymond W. Zakowski, Harwinton, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sep. 20, 1983, Ser. No. 534,007

Int. Cl.³ H01H *9/16*

U.S. Cl. 200—314 **3 Claims**





1. An illuminated flexible touch switch comprising a first laminated switch portion and a second flexible laminated electroluminescent portion,

said first laminated switch portion including a flexible insulated membrane having a conductive switch closure member thereon, a spacer member having an opening aligned with the switch closure member, and an insulated backing member having a plurality of switch contact terminals areas thereon arranged to be connected by said switch closure member upon deformation of the flexible membrane,

said second flexible laminated electroluminescent portion including a first conductive layer, a dielectric matrix comprising a layer of electroluminescent phosphor and epoxy resin, a second transparent conductive layer, and a transparent insulating layer providing a keytop area thereon, wherein said first conductive layer is subdivided into at least two electrodes, and wherein at least two associated contact terminals are disposed on said flexible membrane, said contact terminals being in contact with said respective electrodes,

said keytop area being aligned with said switch closure member, whereby pressing the keytop area actuates the switch, and wherein one of said electrodes is aligned with said keytop area and smaller than the other electrode, whereby the keytop area is brighter than the background area.

4,532,396

FLEXIBLE INDUCTION BRAZING WAND FOR HOLLOW TUBES

Robert D. Bursck, Pleasant Hills, and Thomas J. Saska, Lower Burrell, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1982, Ser. No. 387,297

Int. Cl.³ H05B *6/38*

U.S. Cl. 219—10.49 R **13 Claims**

1. Internal heating apparatus comprising:

a mandrel capable of being disposed in a tube;

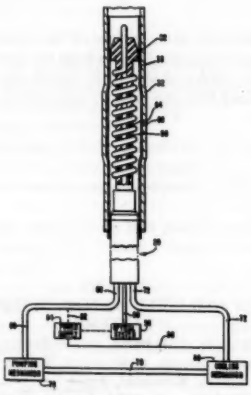
a hollow electrically conductive tubular member mounted on said mandrel and capable of conducting a fluid therethrough, said tubular member having a substantially straight leg and having a portion thereof helically wound around a portion of said mandrel forming an induction coil for heating said tube;

an electrically insulating flexible first cable having a first end and a second end with said first end attached to said mandrel;

an electrically conductive first member having a channel therethrough for conducting a coolant and disposed within said first cable and connected to said mandrel and connected to said tubular member;

an electrically conductive second member having a channel therethrough for conducting a coolant and disposed within said first cable near said second end;

a flexible tubular first conductor disposed in said first cable and connected between said first member and said second member for conducting an electrical current to said tubular member and defining a passageway therein for conducting a coolant to said tubular member;



an electrically conductive third member having a bore therethrough and disposed within said first conductor and attached to a portion of said tubular member extending through and electrically insulated from said first member;

a first conduit disposed through said second member and electrically insulated therefrom, and disposed in said first conductor;

an electrically conductive fourth member having a hole therethrough and attached to said first conduit;

a flexible tubular second conductor disposed in said first conductor and attached between said third member and said fourth member for conducting an electrical current between said third member and said fourth member and for conducting a coolant therethrough; and

an electrically insulating flexible second cable attached to said third member and to said fourth member and disposed over said second conductor for electrically insulating said second conductor from said first conductor.

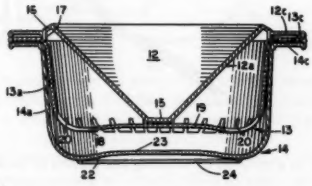
4,532,397

OVENWARE RECEPTACLE SYSTEM

Donald R. McClelland, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 6, 1982, Ser. No. 395,652
Int. Cl.³ H05B *6/80*
U.S. Cl. 219—10.55 E **9 Claims**

1. A combination of microwave-transparent receptacles adapted selectively for cooking a variety of foods including popping grain in a microwave oven and storing the popped kernels and for defrosting, cooking and steaming other foods, comprising a storage receptacle having an upper rim, a conical popper receptacle having an upper rim, and a perforated receptacle nestable in said storage receptacle and having an upper rim, the popper receptacle being nestable in said perforated receptacle, the upper rims of said popper receptacle, perforated receptacle and storage receptacle adapted to fit one upon another in selective upright nested or inverted positions



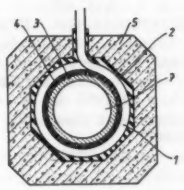
thereby supporting said respective receptacles relative to one another, said perforated receptacle adapted to confine popped kernels when assembled in inverted position on said popper receptacle in upright position within said storage receptacle, and to transfer popped kernels into said storage receptacle by bodily inverting said assembly, removing said popper receptacle and bodily reinverting said storage receptacle and said perforated receptacle.

4,532,398

INDUCTION COIL

Bengt Henriksson, Helsingborg, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 1, 1982, Ser. No. 446,050
Claims priority, application Sweden, Dec. 4, 1981, 8107289
Int. Cl.³ H05B *6/36*
U.S. Cl. 219—10.79 **17 Claims**



1. An induction coil comprising an electrically conducting working coil, an outer casing for the coil and a lead-through channel disposed within the working coil for workpieces which are to be treated therein, the outer casing comprising at least one compressible hollow body of a temperature-resistant silicone rubber, capable of withstanding temperature of about

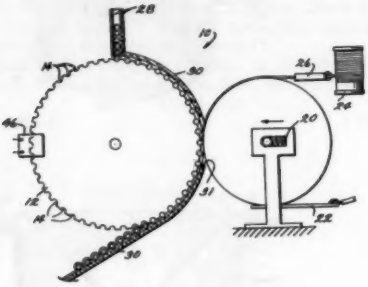
200 degrees C., adjacent to the working coil and a mass of concrete over said hollow body.

4,532,399

APPARATUS AND METHOD OF WELDING NAILS TO WIRES

Paul W. Jones, Jamestown, R.I., assignor to Textron Inc., Providence, R.I.

Continuation of Ser. No. 370,527, Apr. 21, 1982, abandoned.
This application Oct. 16, 1984, Ser. No. 661,270
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—117.1 **16 Claims**



1. In a method of welding the shanks of succesive nails to a pair of wires to form a series of wire connected nails suitable for packaging and use in a power driven fastener driving device, said method comprising the steps of connecting a pair of electrodes with a source of electrical current characterized by repetitive cycles and effecting repetitive nail-to-wire cycles each of which includes an initial movement of (1) the shank of an unattached nail (2) a pair of wires extending transversely thereacross and (3) said electrodes from a position of initial contact into a welding station wherein pressurized contact between said electrodes, said nail shank and said wires is maintained and a final movement out of said welding station to a final release position of said electrodes with respect to the welded together nail shank and wires, the improvement which comprises the step of:

synchronizing the electrical current cycles connected with said electrodes and said nail-to-wire cycles so that a similar portion of each current cycle will flow through each unattached nail and said pair of wires between said electrodes during the time period of each nail-to-wire cycle when the latter are in said welding station.

4,532,400

LASER IRRADIATING APPARATUS

Masahiro Toida, Kanagawa; Norihiro Suenaga, Tokyo, and Nobuyuki Suenaga, Kanagawa, all of Japan, assignors to Nippon Infrared Industries Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,185
Claims priority, application Japan, Oct. 1, 1982, 57-172984; Nov. 6, 1982, 57-194877
Int. Cl.³ B23K *26/00*
U.S. Cl. 219—121 LS **15 Claims**

1. A laser irradiating apparatus comprising:

a plurality of laser sources for outputting a plurality of laser beams each having a different wave-length;

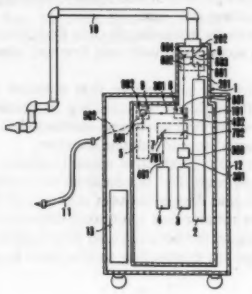
a guide beam source for outputting a visible guide beam;

mixing means for coaxially mixing at least one of the laser beams with said visible guide beam;

light guide means for guiding said mixed laser beam and visible guide beam to a desired target;

said laser sources, said guide beam source, said light guide means and said mixing means all being fixed on a single support stand having a support plate; and

at least one of said laser sources and said guide beam source



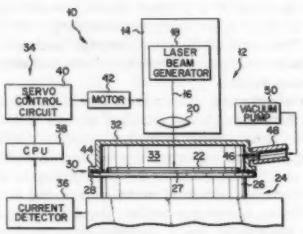
being fixed to the same surface of the support plate so as to assure that all irradiated beams from the sources are directed in the same direction and their optical axis are kept at the same distance from the support plate and in parallel thereto.

4,532,401

APPARATUS AND METHOD FOR CUTTING A WIRING PATTERN

Masakazu Shiozaki, Yokohama, and Hidetaro Nishimura, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,382
Claims priority, application Japan, Mar. 31, 1982, 57-53456
Int. Cl.³ B23K *26/00*
U.S. Cl. 219—121 LH **14 Claims**



1. An apparatus for cutting a wiring pattern by radiating a laser beam, comprising:

placing means for placing a substrate on which said wiring pattern is formed;

fixing means for fixing said substrate in place, said fixing means including an insulating material that permits said substrate to be attached to said placing means by an electrostatic attraction;

vacuum means for defining a space including said wiring pattern and for keeping said space at a vacuum level less than atmospheric pressure; and

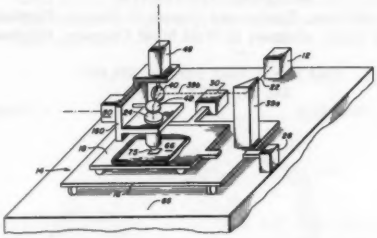
laser beam radiating means for radiating a laser beam toward said wiring pattern to cut a portion of said wiring pattern.

4,532,402

METHOD AND APPARATUS FOR POSITIONING A FOCUSED BEAM ON AN INTEGRATED CIRCUIT

James W. Overbeck, Hingham, Mass., assignor to XRL, Inc., Hingham, Mass.

Filed Sep. 2, 1983, Ser. No. 529,025
Int. Cl.³ B23K 26/02, 26/08
U.S. Cl. 219—121 LU 13 Claims



1. Apparatus for accurately positioning focused electromagnetic energy on a semiconductor surface comprising

a beam source of electromagnetic energy,

a movable platform assembly,

means for moving said platform assembly in first and second directions parallel to a movement plane,

a rotatable mirror means supported by said platform assembly,

an optical system supported by said platform assembly for focusing an energy beam incident thereon on said semiconductor surface,

means for directing said beam source of electromagnetic energy onto said mirror means,

said mirror means deflecting said incident energy beam source to a direction wherein the deflected beam passes through said optical system for focusing said beam on said semiconductor surface, and

a control means for controlling the position of said platform assembly and of said mirror means for accurately positioning said beam source onto said semiconductor surface as a cell of focused energy.

4,532,403

WELD SPATTER PROTECTIVE COATING

Lester W. Jordan, Cranston, R.I.; Joseph F. Loersch, Bolton, and Robert G. Adinolfi, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1984, Ser. No. 600,639
Int. Cl.³ B23K 15/00
U.S. Cl. 219—121 ED 2 Claims

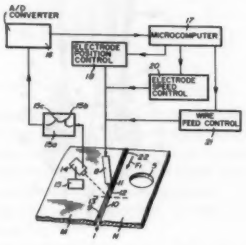
1. A method of welding by localized impingement of electron beam energy on a workpiece surface, wherein the improvement comprises coating the workpiece surface with an adherent, acid resistant, heat stable, chemically removeable layer of polyimide containing less than about 0.5% by volume surfactant on the nonweld areas prior to welding, and removing the polyimide layer after welding.

4,532,404

REAL TIME CONTROL SYSTEM AND PROCESS FOR CONTROLLING PREDETERMINED OPERATING CHARACTERISTICS OF A WELDING MECHANISM

Jean-Paul Boillot, Beloeil; Ghislain Bégin, Boucherville; N. Alexandrov, St. Bruno; Jean-Luc Fihey, Ste-Julie; A. Di Vincenzo, Anjou, and Denis Villemure, St. Bruno, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 1, 1983, Ser. No. 462,713
Int. Cl.³ B23K 9/10
U.S. Cl. 219—124.34 34 Claims



1. A real time control system for controlling predetermined operating characteristics of a welding mechanism movable along a workpiece joint to be welded, said workpiece joint having two opposed edges, said system comprising:

thermal radiation sensing means responsive to thermal radiation energy emanating from a heated workpiece joint, said sensing means being positioned along a travelling path of a welding element of said welding mechanism, ahead of and in close proximity to said welding element, said sensing means and welding element being disposed on a common side relative to said workpiece joint;

means for causing said thermal radiation sensing means to scan said workpiece joint along a line transverse to said travelling path so as to allow said sensing means to sense a thermal radiation profile along said transverse scanning line and to provide peak signals representative of the relative position of the edges of said workpiece joint in accordance with the thermal radiation profile sensed, thereby defining the actual width of said joint; and

circuitry means for processing said peak signals provided by said radiation sensing means to issue command signals for controlling said predetermined operating characteristics of said welding mechanism.

4,532,405

ARC WELDING TORCH WITH TWO INTEGRAL OPTICAL SYSTEMS

Nelson R. Corby, Jr.; Richard M. Lund, both of Scotia, and Donald C. Peroutky, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,512
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 9 Claims

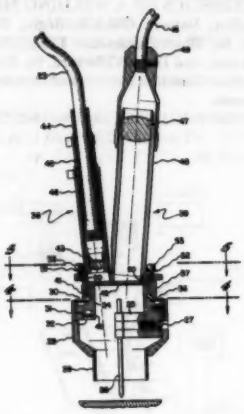
1. An electric arc welding torch for robotic welding comprising:

a ring-shaped metal torch body having a central aperture, an inwardly projecting slim profile, electrode holder, and cover gas, coolant, and electrical power connections;

a shroud on said torch body to which is attached a gas nozzle;

a projection optical system and a viewing optical system supported on said torch body, the first projecting a light pattern through said central aperture onto a workpiece and the second viewing the weld puddle and light pattern through said central aperture and providing an image to be transferred to a controller;

said projection and viewing optical systems being inclined away from one another at an optimum angle, determined



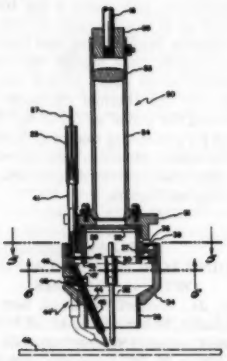
by the angle of reflection, to intercept the light reflected from the projected light pattern.

4,532,406

ARC WELDING TORCH HAVING INTEGRATED WIRE FEED

Thomas P. Povlick, Clifton Park, and Richard M. Lund, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1984, Ser. No. 579,046
Int. Cl.³ B23K *9/16*
U.S. Cl. 219—124.34 **7 Claims**



5. A robotic gas tungsten arc welding torch comprising:

a ring-shaped, electrically conductive torch body having thereon a cover gas connection tube to supply cover gas to first passages in said torch body and hence to a gas nozzle, and coolant connection tubes to supply and return coolant that flows in second passages in said torch body, one of said coolant connection tubes conducting electrical current for the weld process to said torch body and to a slim profile inwardly projecting electrode holder that holds a tungsten electrode;

a shroud supporting said torch body and gas nozzle;

an integral optical vision system which views the workpiece and weld puddle through the center of said ring-shaped torch body and provides an image to a remote controller; and

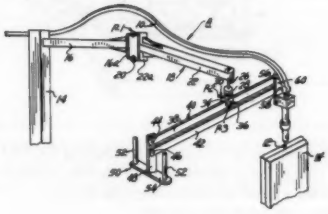
an integral wire feed guide tube for carrying to the vicinity of the arc a filler wire that is passed through said gas connection tube and torch body.

4,532,407

WELDING APPARATUS

Dean T. Williams, Canton, and Charles E. Swiney, Hartland, both of Mich., assignors to Weld Mold Company, Brighton, Mich.

Filed Dec. 6, 1983, Ser. No. 558,491
Int. Cl.³ B23K *37/02*
U.S. Cl. 219—125.1 **5 Claims**



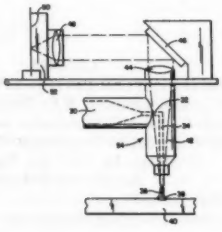
1. A welding electrode support and guide structure for use in closely adjacent hand manipulable welding operations, comprising a generally vertically disposed mounting member, a support arm member connected to said mounting member and swingable with respect thereto in a substantially horizontal plane, a swivel joint assembly carried by said support arm member adjacent one end thereof, a hingedly connected framework mounted generally intermediate of its opposite ends by said swivel joint assembly, and means at one end of said framework for actuating said swivel joint assembly and said swingable support arm member to move an electrode carried at the opposite end of said framework in generally horizontal, vertical and arcuate planes with respect to a workpiece being welded.

4,532,408

APPARATUS AND METHOD FOR VIEWING MOLTEN POOLS IN ARC WELDING

Richard W. Richardson, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Filed Oct. 22, 1982, Ser. No. 436,026
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.01 **48 Claims**



1. An optical apparatus for use in viewing an arc welding process the apparatus comprising:

(a) a welding torch with an electrode mounted therein, the electrode having a tip from which an arc is drawn during

welding at a region of a base metal, the electrode having a linear portion extending from the tip; and

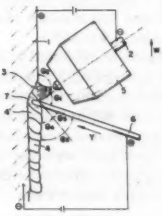
(b) an optical system including a lens and having an optical path for conveying a bundle of light rays reflected from the weld region of the base metal around the electrode tip to said lens for focusing the light to form a machine readable image, wherein the axis of the bundle of light rays at the initial portion of said optical path extends from the weld region parallel to said linear portion of the electrode, said bundle of light rays substantially surrounding said linear tip end.

4,532,409

METHOD FOR GAS SHIELDED ARC WELDING WITH DIRECT CURRENT NON-CONSUMABLE ELECTRODE

Yohji Ogata; Isao Aida; Hirokazu Murayama, and Kenjiro Shibuya, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 6, 1981, Ser. No. 251,971
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—137 R **7 Claims**



1. A welding method which comprises the steps of:

(a) connecting a non-consumable electrode and filler wire to independent DC power sources, the non-consumable electrode being located in a position forward of the filler wire as seen in the direction of travel;

(b) maintaining the following angular relationships during welding:

(i) an angle θ_1 of between 20° and 60° between the non-consumable electrode and the filler wire;

(ii) an angie θ_2 of between 60° and 85° between the non-consumable electrode and the workpiece;

(iii) an angle θ_3 of between 50° and 75° between the filler wire and the workpiece;

(iv) an angle θ_4 of between the molten pool surface and the surface of the welded base metal of between 35° and 60° for vertical welding and of between 35° and 45° for horizontal, downhand, or overhead wleding; and

(v) an angle θ_5 of not less than 15° between the molten pool surface and the filler wire;

(c) applying electric current having opposite directions to the non-consumable electrode and the filler wire;

(d) pulsating the current applied to the filler wire so as to weave the arc produced across the non-consumable electrode and the workpiece along a line lying in the direction of travel;

(e) oscillating the non-consumable electrode and the filler wire in the direction perpendicular to the direction of travel in the plane of the workpiece; and

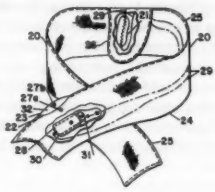
(f) varying the amplitude of the pulsating current to compensate for abnormalities along the weld line.

4,532,410

LOW VOLTAGE BATTERY OPERATED HEATING BIB

Betty A. Wehmeyer, P.O. Box 118, Ingram, Tex. 78025

Filed Sep. 12, 1983, Ser. No. 531,407
Int. Cl.³ H05B *3/34*
U.S. Cl. 219—211 **4 Claims**



1. A low battery operated heating device comprising:

a fabric scarf having a length from a first end to a second end greater than its width from a first side to a center fold line when said scarf has been folded on itself along a center fold line running from a first end to a second end; to define a back portion and a front portion of substantially equal widths and lengths;

said scarf having an appendage in the form of a bib at right angles to the center fold line and midway between the first and second ends of the scarf;

said bib comprising a front portion and a back portion of substantially equal lengths and widths;

said front portion being constructed as an integral part of the scarf;

said back portion being constructed of a fabric capable of moisture absorbency and of diffusing heat, being attached to the scarf in such manner that when joined to said scarf it is of equal size and shape as the front portion of said bib;

a heater means disposed in said bib;

said heater means comprising a strip of electrical resistance material disposed in said bib of sufficient length and width so that said heater means completely covers a posterior Cervical Plexus when positioned next to a human body;

strips of heat diffusing material secured in back to back relationship for sandwiching said heater element therebetween; a means of disposing said heat diffusing material in said bib;

said means of disposing consisting of a resin-impregnated fabric by which heat diffusing material is secured;

a seam joining together said front and back portions of said bib and joining said back portion to said scarf;

said scarf having a sewn seam joining together said front portion and said back portion along a longitudinal edge opposite said center fold line and sewn seams joining said front and back portions at a first edge adjacent said first end and at second edge adjacent said end of said scarf;

a sewn seam joining together longitudinal edges and ends of said scarf; a means for supporting a low voltage battery within the folded portions of said scarf;

said means for supporting said battery comprising a single piece of flexible blank substantially rectangular in shape to define a back, a bottom, a front and a flap portion, said flap portion serving as a top covering of a pocket for receiving a battery;

said pocket being constructed by folding the front portion of said blank against the back portion of said blank so that the front portion is of a length at least equal to that of a low voltage battery and the back portion extends above the front portion to provide said covering flap;

a sewn seam securing longitudinal edges of said blank to form said pocket;

said pocket being open at a top edge to provide access to the pocket;

means for securing said pocket in the scarf in closed position when the battery is removed from the pocket and when the battery has been placed in said pocket; opposed elec-

trical contacts connected to said pocket for engaging electrodes of a battery when said flap is closed on the pocket;

said opposed contacts including a connecting plate disposed in said pocket bottom;

a contact button connected to said flap of said pocket for an engaging electrode of a battery for electrical contact with said flap in closed position on said pocket;

means for securing said flap in closed position;

electrical conductors connecting each of said contacts in circuit with said resistance material and said electrical conductors extending between said back and front portions of said scarf from contacts on said pocket to contacts of said resistance material in said bib;

4,532,411

ELECTRIC FABRIC STEAMING APPLIANCE HAVING A DETACHABLE METALLIC SOLE-PLATE

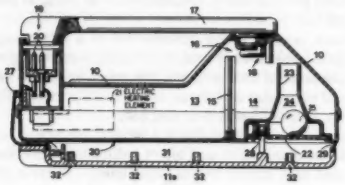
Marc Terraillon, 16, rue des Granges, 1204 Geneva, Switzerland, and Daniel Mazzucco, 3, rue Ecole Maternelle, Annemasse, France

Filed Mar. 11, 1983, Ser. No. 474,291

Claims priority, application Switzerland, Mar. 19, 1982, 1772/82

Int. Cl.³ H05B *1/02;* **D06F** *75/16, 75/32*

U.S. Cl. 219—245 **5 Claims**



1. An electric appliance for steaming fabric including

(a) a non-metallic hollow body having

(1) a first compartment for receiving and containing water,

(2) means for electrically heating the water to produce steam,

(3) means on said body for electrically connecting said electric water-heating means to a source of electric power, and

(4) a second compartment communicating with the first compartment for receiving and containing the steam, said second compartment having a non-metallic wall with orifices formed therein through which the steam can issue from said second compartment for steaming said fabric without the non-metallic wall contacting said fabric;

(b) a metallic sole-plate having an exposed ironing surface;

(c) means for removably attaching the sole-plate to the non-metallic hollow body for ironing said fabric, said sole-plate being in spaced relationship with said wall of the second compartment so as to define therewith a third compartment receiving steam issuing from said orifices in said wall so as to heat said sole-plate;

(d) steam outlets in said sole-plate and communicating with said third compartment, through which the steam issues for steaming said fabric when said sole-plate is attached to said body; and

(e) sealing means extending between said sole-plate and said wall of said second compartment for sealing the periphery of the space defining said third compartment.

4,532,412

ELECTRIC STEAM GENERATOR PRODUCING DRY SUPERHEATED STEAM FOR DOMESTIC USE

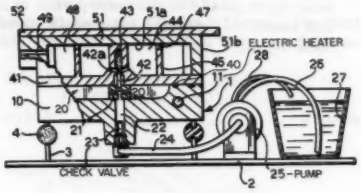
Guido Birocchi, 74, Via Pier della Francesca, Milan, Italy

Filed Jun. 22, 1983, Ser. No. 506,667

Claims priority, application Italy, Jun. 24, 1982, 22053 A/82

Int. Cl.³ F22B *1/28, 27/00, 37/26;* **H05B** *3/02*

U.S. Cl. 219—271 **5 Claims**



1. A steam generator for domestic use, of the type provided with an electric heater and including:

a generator cylindrical body provided with a plurality of upwardly open sector-shaped vaporization chambers each including a water inlet and a steam outlet;

a removable plate closing the top of said upwardly open vaporization chambers and defining a first superheating chamber having a steam inlet in communication with the steam outlets of said vaporization chambers and a superheated steam outlet;

an inverted cup-shaped body closed at its top by a plate and having a lateral wall defining, together with said removable plate, a second superheating chamber having an inlet communicating with the outlet of the first superheating chamber and a superheated steam delivery outlet;

an electric heater associated with the cylindrical body for heating the vaporization chambers and the superheating chambers to operative temperature.

4,532,413

STEAM GENERATOR HEATED BY COMBINATION OF ELECTRIC HEAT AND CONDENSATION OF CONTAMINATED PROCESS STEAM

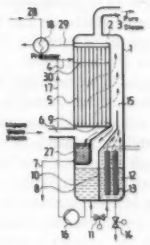
Heikki Ahonen, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy, Valkeakoski, Finland

Filed Oct. 18, 1982, Ser. No. 434,847

Claims priority, application Finland, May 4, 1982, 821565

Int. Cl.³ D21F *5/20;* **F22B** *1/16, 1/30;* **H05B** *3/60*

U.S. Cl. 219—279 **6 Claims**



1. A steam generator assembly, in particular a steam generator assembly used in connection with the mechanical preparation of pulp, for generating pure steam required in a subsequent process, such as in a drying of paper in a paper machine, by utilizing the condensation heat of contaminated steam coming from a preceding process, such as a grinding process, comprising:

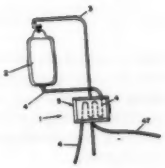
a steam converter;
means for supplying water to be converted to pure steam to said steam converter;
means for supplying contaminated steam to said steam converter;
said steam converter utilizing the condensation heat of the contaminated steam from a process producing contaminated steam for generating pure steam;
an electrical boiler connected in parallel with the steam converter for generating pure steam independently of said steam converter;
at least one electrically energizable power electrode arranged within the electrical boiler, said at least one electrode adapted to generate steam when electrically energized and moistened and each electrode comprising an outer face;
means for supplying water to the electrical boiler for selectively moistening the outer face of said at least one electrode to generate pure steam therein; and
means for selectively controlling said water supplying means and the extent of the moistened area of the outer face of said at least one electrode and thereby the amount of pure steam generated by the electrical boiler;
a common housing including a pure steam outlet in operative communication for receiving pure steam from an outlet of the steam converter and the electrical boiler;
wherein the steam converter and the electrical boiler are arranged within said common housing so as to form a unified structure.

4,532,414

CONTROLLED TEMPERATURE BLOOD WARMING APPARATUS

Ramesh M. Shah, Indianapolis, Ind., and Thomas H. Ridgway, Cincinnati, Ohio, assignors to Data Chem., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 148,731, May 12, 1980, abandoned. This application May 4, 1981, Ser. No. 260,035
Int. Cl.³ H05B *1/02*; B67D *5/62*; A61F *7/00*; F24H *1/12*
U.S. Cl. 219—308 **6 Claims**



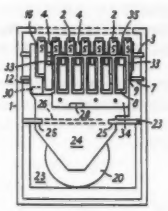
1. In an in-line warmer for heating parenteral fluid and the like supplied from a fluid container (2) through a flexible supply conduit (4) of the type having a box-like fluid warmer enclosure (5) including a closable cover (11), a substantially planar heating plate (19) positioned within the enclosure, one surface of the plate including a sinuously-shaped groove (23) configured to maintain a length of the supply conduit in heat transfer relationship with the plate for heating the fluid within the conduit, electric heating means (34) for heating the plate, and a semiconductor switch (TR1) operatively connected between said heating means and a source of alternating voltage (52) for controlling current flow to the heating means when said switch is activated, the improvement in combination therewith comprising means for maintaining the temperature of the plate at a predetermined temperature to prevent overheating of the parenteral fluid or the like comprising:
a first temperature sensor (37) attached in heat transfer relationship to said plate for providing a first electrical signal representative of the actual temperature of the plate;
a voltage controlled oscillator (101) responsive to said first electrical signal producing an oscillating output signal having a frequency of oscillation which varies with the temperature of the plate as sensed by said first sensor, said circuit being so designed that said oscillating output signal ceases whenever the temperature of said plate as sensed by said first sensor exceeds said predetermined temperature;
a second temperature sensor (38) attached in heat transfer relationship, to said plate for producing a second electrical signal representative of the actual temperature of the plate;
comparison means (A3) responsive to said second electrical signal for producing an output signal when the temperature of the plate as sensed by said second sensor exceeds a predetermined maximum permissible plate temperature value representative of the overheating temperature of the fluid; and
switch control means (105) for activating said semiconductor switch to cause current flow to the heater means in proportion to the frequency of the oscillating output signal to heat the fluid only in response to the presence of said oscillating output signal and for deactivating the semiconductor switch to prevent current flow to the heater means in response to either the absence of the oscillating signal or to the presence of said comparison means output signal, or both,
whereby component failure associated with said oscillator (101) or switch control means (105) will cause the oscillating output signal to cease, thereby de-energizing the heater means to prevent overheating of the fluid.

4,532,415

NUMBER WHEEL COUNTERS

Peter Alway, Bushey, England, assignor to Mecom Standard Limited, London, England

Filed Jun. 23, 1981, Ser. No. 279,987
Int. Cl.³ G06C *25/00*
U.S. Cl. 235—131 R **9 Claims**



1. A counter comprising
(A) a plurality of successive coaxial number wheels;
(B) a different ring of gear teeth on each number wheel;
(C) a different transfer means on each number wheel;
(D) transfer pinions respectively disposed intermediate successive number wheels
(i) each pinion meshing with a ring of gear teeth on one of the number wheels adjacent thereto and adapted to engage transfer means on the preceding number wheel during rotation of said preceding number wheel thereby partially to rotate said one of the number wheels;
(E) drive means intermittently actuable to rotate a first one

of the number wheels thereby to effect counting of the counter; and

(F) alignment means disposed in a rest position to operatively engage at least the last number wheel through the transfer pinion in mesh therewith thereby to inhibit rotation of said number wheel between counts,

(i) the alignment means being momentarily displaced from said rest position upon each actuation of the drive means to enable unhindered rotation of the number wheels during counting,

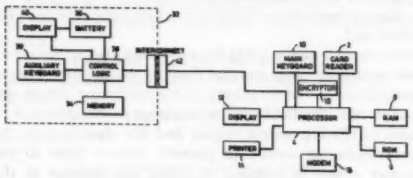
(ii) the alignment means comprises leaf spring means carried upon a reciprocating element of the drive means.

4,532,416

TRANSACTION TERMINAL WITH SIMPLIFIED DATA ENTRY

Patrick Berstein, 209 Willowbrook Rd., Thornhill, Ontario, Canada

Filed Jan. 3, 1983, Ser. No. 455,044
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 **13 Claims**



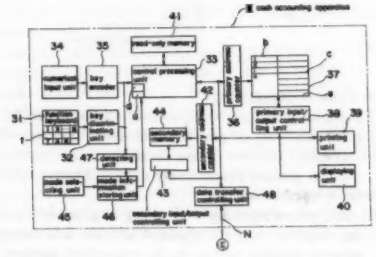
1. A transaction terminal comprising a reader to read data from any one of a plurality of suitably encoded cards, a keyboard, and a data processor receiving data and storing data from said reader and said keyboard, said data processor having an operating mode and at least one supervisory mode, and said cards being of at least three classes, each being encoded with a different class of data recognizable to the processor, the processor being responsive to data on cards of a first class to enable it to enter said at least one supervisory mode, and being controlled jointly by data from the keyboard and data from cards of a second class in said operating mode, and being controlled jointly by data from the keyboard and data from a third class of cards in at least one supervisory mode.

4,532,417

CASH ACCOUNTING SYSTEM

Katsuji Nishimura, Habikino, and Hachizou Yamamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1983, Ser. No. 470,778
Claims priority, application Japan, Mar. 8, 1982, 57-36780
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 **1 Claim**



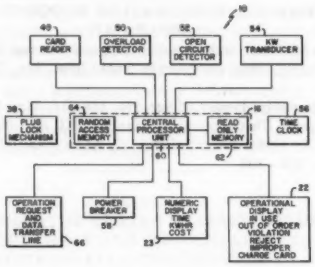
1. A cash accounting system wherein a cash accounting apparatus for registering and processing various cash transaction informations is electrically connected with a money paying-out apparatus for paying out money such as bills, coins, corresponding to the amount due caused by each transaction registration, comprising a manual handling instruction unit for instructing the manual handling operation of some denominations and sub-amounts of said payment money-amount, a storing unit for storing the denominations, sub-amounts, etc. instructed to be manually handled by said instruction unit, and a controlling unit for paying out, by said money paying-out apparatus, the remaining payment amount of the money amount instructed to be manually handled by said manual handling instruction unit.

4,532,418

MICROPROCESSOR ELECTRIC VEHICLE CHARGING AND PARKING METER SYSTEM STRUCTURE AND METHOD

William G. Meese, Bloomfield Hills; Robert G. Pratt, Farmington Hills; Mitchell D. Charneski, Southfield; Robert E. Brokenshire, Troy, and Bruce F. Whitney, South Lyon, all of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Continuation of Ser. No. 413,089, Aug. 30, 1982, abandoned, which is a continuation of Ser. No. 194,044, Oct. 6, 1980, abandoned. This application Dec. 21, 1984, Ser. No. 684,160
Int. Cl.³ B65G *11/00*; G06F *7/08*
U.S. Cl. 235—381 **12 Claims**



1. A charging meter for electric vehicles and like devices comprising

an enclosure including means for mounting said enclosure adjacent to a vehicle parking location,

a card reader within said enclosure with an opening for receiving an operator card from externally of said enclosure and for activating said meter as a function of indicia on a card inserted therein,

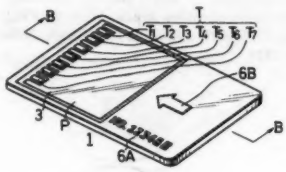
plug means on said enclosure including an electrical receptacle for receiving the plug of a power cable coupled to a vehicle, and means for selectively and releasably locking the plug into said receptacle to prevent removal of the plug and cable during charging of the vehicle, and

central processing and control means including first means coupled to said reader and responsive to insertion of an operator indicia-containing card into said reader for initiating a charging operation, second means responsive to said first means for activating said locking means so as to prevent removal of a plug from said receptacle during said charging operation, third means responsive to said first means for supplying electrical energy to said receptacle during said charging operation, fourth means for terminating a charging operation, and fifth means responsive to said fourth means for terminating supply of electrical energy to said receptacle and for releasing said locking means.

4,532,419
MEMORY CARD HAVING STATIC ELECTRICITY PROTECTION

Masahiro Takeda, Ohmiya, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,467
Claims priority, application Japan, Sep. 9, 1982, 57-156982; Sep. 30, 1982, 57-148913[U]
Int. Cl.³ G06K 19/06
U.S. Cl. 235—492 13 Claims

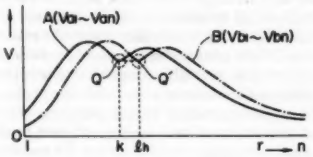


1. A memory card for use as a credit card and/or identification card and comprising:
card support means;
integrated circuit means mounted on said card support means for storing information and including a plurality of access terminals;
a plurality of connection terminals provided on an exposed surface of said card support means and respectively connected to said access terminals on said integrated circuit means; and
unitary discharge pattern means provided on said exposed surface of said card support means and separated from each of said connection terminals by a discharge gap for discharging static electricity from said connection terminals to said discharge pattern means to prevent damage to said integrated circuit means.

4,532,420
FOCUS DETECTOR WITH CHARACTERISTIC POINT DETECTION

Yukio Nakajima, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Oct. 1, 1982, Ser. No. 432,318
Claims priority, application Japan, Dec. 9, 1981, 56-198130
Int. Cl.³ G01J 1/20
U.S. Cl. 250—201 6 Claims

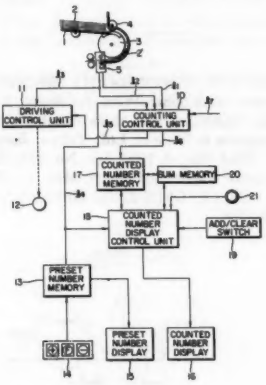


1. A focus detector of the image correlation type, comprising:
imaging optics of the image correlation type for focussing light received from an object upon which a focussing operation is to be performed;
light receiver means including a first and a second array of photoelectric transducer elements, each array positioned to receive a different portion of the light passing through said imaging optics, each of said transducer elements producing an output in accordance with the intensity of the light received thereby such that each said array generates a distribution of outputs indicative of the distribution of light received by the individual transducer elements of that array; and
arithmetic means for detecting an in-focus condition as a result of an arithmetic operation which is performed on said distributions, said arithmetic operation including the identification of a characteristic point on the distribution of outputs from the first array, the identification of a corresponding characteristic point in the distribution of outputs from the second array, and the detection of an in-focus condition on the basis of the relative position between that particular transducer element in said first array which produces an output corresponding to said characteristic point in said first array and that particular transducer element in the second array which produces an output corresponding to said corresponding characteristic point in said second array.

4,532,421
APPARATUS FOR COUNTING PAPER SHEETS

Takashi Sasaoka, and Tsuneyoshi Mitani, both of Kawasaki, Japan, assignors to Musashi Co., Ltd. and Musashi Engineering Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,480
Claims priority, application Japan, Jul. 10, 1982, 57-120154
Int. Cl.³ G06M 7/00
U.S. Cl. 250—223 R 1 Claim



1. A counting device for paper sheets comprising:
a sensor provided in a paper sheet transfer path adapted for transporting the paper sheets from a paper sheet supply station to a paper sheet receiving station, said paper sheets being separated during transport through said path into individual paper sheets from a stack held in the supply station, said sensor sensing the number of the paper sheets passing therethrough and issuing a count number signal, said sensor also sensing the occurrence of an unusual transport state and issuing an unusual transport signal upon occurrence thereof;
a counting control unit adapted for comparing said count number signal from said sensor to a preset number signal from a preset number memory and issuing a corresponding control signal;
a drive control unit for controlling the driving of said transport path depending upon said control signal supplied from said counting control unit and for terminating the driving of said transport path upon reception of said unusual transport signal from said sensor;
a counted number memory for receiving and storing said count number signal supplied from said sensor through said counting control unit;
a counted number display control unit for receiving said counted number signal stored in said counted number memory and displaying a numerical figure corresponding

to said counted number signal in a counted number display unit;

an add/clear switch connected to said counted number display control unit and adapted for setting the counting and display mode to an add mode batch counting or to a clear mode batch counting;

a provisional sum memory for storing the sum obtained until the end of counting of the preceding batch of paper sheets and outputting the stored data to said counted number display control unit;

a reset switch for resetting said counted number memory and said provisional sum memory; and

said counted number display control unit operating during batch counting in such a manner that the sum obtained until the end of counting of the preceding batch is not displayed in said counted number display unit when the add/clear switch is set to clear mode batch counting, the data stored in said provisional sum memory and the data stored in said counted number memory are added together and the resulting sum is displayed in said counted number display unit when said add/clear switch is set to the add mode batch counting and that only the data stored in said counted number memory is erased when said reset switch is pressed once while both the data stored in said counted number memory and the data stored in said provisional sum memory are erased when said reset switch is pressed twice.

4,532,422

ELECTRON HOLOGRAPHY MICROSCOPE

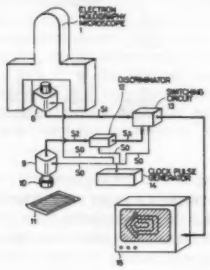
Setsuo Nomura, Nishitama; Akira Tonomura, Koganei; Nobuo Hamamoto, Nishitama, and Akira Fukuhara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,232

Claims priority, application Japan, Mar. 12, 1982, 57-38013

Int. Cl.³ G01N *23/00*; H01J *39/12*

U.S. Cl. 250—306 **10 Claims**



1. An electron holography microscope system comprising:

(a) an electron holography microscope for producing an interference pattern of a specimen;

(b) image forming means for producing an electrical output signal produced by the scanning of the interference pattern of the specimen formed by the electron holography microscope;

(c) means for generating a signal representing a straight line fringe pattern as a basic fringe pattern produced by scanning an image of spaced apart parallel lines as basic fringes, the spacing between the interference fringes of the interference pattern and the spaced apart parallel lines being such that the ratio of the spacing between adjacent parallel spaced apart lines and the spacing between adjacent interference fringes is 1 or 1/n, where n is an integer;

(d) means for combining the straight line fringe signal and the electrical output signal of the image forming means to produce a composite signal; and

(e) means for displaying the composite signal to produce a composite image of the interference pattern of the specimen and the straight line fringe signal.

4,532,423

IC TESTER USING AN ELECTRON BEAM CAPABLE OF EASILY SETTING A PROBE CARD UNIT FOR WAFERS & PACKAGED IC'S TO BE TESTED

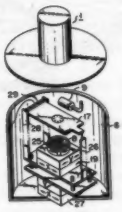
Toru Tojo, Yamato, and Kazuyoshi Sugihara, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1983, Ser. No. 495,486

Claims priority, application Japan, May 31, 1982, 57-92919

Int. Cl.³ G01R *31/02, 31/26*; G01N *23/00*

U.S. Cl. 250—310 **12 Claims**



1. An integrated circuit tester using an electron beam, comprising:

a specimen chamber provided with a Z table and an X-Y table for holding a probe card unit to make electrical contact between electrical terminals of a specimen placed in said specimen chamber and lead wires led outside of said specimen chamber;

an electron optical column disposed on said specimen chamber for radiating an electron beam to said specimen;

a table drive system for driving said Z table in the direction of electron beam radiation and said X-Y table in X- and Y-directions in a plane perpendicular to the direction of electron beam radiation;

said probe card unit comprising a plurality of electrical terminals which are arranged in a predetermined position relation on a top surface thereof to be connected to said electrical terminals of said specimen;

said Z table including a fixed table provided with a plurality of downwardly protruding spring contact pins which are connected to said lead wires led outside of said specimen chamber and arranged in the same position relation as that of said electrical terminals on said probe card unit; and

a probe card unit fixing mechanism attached to the undersurface of said fixed table and so arranged to allow said probe card unit to slide laterally along the undersurface of said fixed table and to move upward after the probe card unit reaches a predetermined lateral position, whereby the upward movement of said probe card unit results in the probe card unit being pressed against the undersurface of said fixed table and said spring contact pins being brought into electrical contact with their corresponding electrical terminals on the top surface of said probe card unit.

4,532,424

PYROELECTRIC THERMAL DETECTOR ARRAY

Derek T. Cheung, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 25, 1983, Ser. No. 487,659

Int. Cl.³ G01J *5/10*

U.S. Cl. 250—338 **9 Claims**

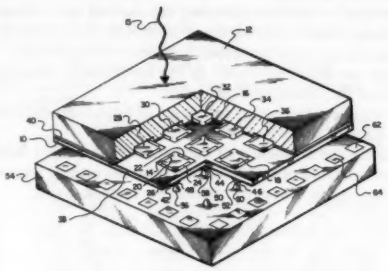
1. A thermal detector array, comprising:

a substrate layer;

a pyroelectric layer supported by a surface of said substrate;

a plurality of detector regions in said pyroelectric layer,

each region defined by a plurality of openings which extend through said pyroelectric layer and circumscribe said region; and



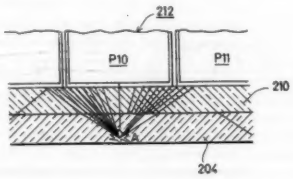
a plurality of cavities in said substrate surface, each cavity separating one of said detector regions from said surface.

4,532,425

GAMMA CAMERA WITH LIGHT GUIDE HAVING GREATER INDEX OF REFRACTION

Adi Abileah, Kiriat Bialik; Giora Gafni, and Miguel O. Simerman, both of Haifa, all of Israel, assignors to Elscint Inc., Boston, Mass.

Filed Aug. 4, 1982, Ser. No. 405,244
Int. Cl.³ G01T *1/202*
U.S. Cl. 250—363 S **10 Claims**



1. A gamma camera including a scintillation crystal, a collimator for transferring a gamma-ray image to one face of the crystal, a plurality of photomultiplier tubes arrayed at the opposite face of said crystal for receiving the light photons emitted by the crystal as a result of the absorption thereby of gamma rays, and a transparent light guide interposed between said opposite face of the crystal and said photomultiplier tubes, said crystal having an index of refraction of 1.80–1.90, and said light guide having an index of refraction of at least 1.60.

4,532,426

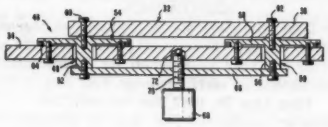
WAFER HEIGHT CORRECTION SYSTEM FOR FOCUSED BEAM SYSTEM

John W. Reeds, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 17, 1983, Ser. No. 505,563
Int. Cl.³ G21K *5/10*
U.S. Cl. 250—442.1 **16 Claims**

1. An adjustable height wafer support for a focused beam system wherein a column directs a focused beam into a target chamber and the target chamber has said wafer support therein for supporting a wafer in the path of the beam emitted from the column, the improvement comprising:

a flexible member between said wafer support and the column and fastened to both said wafer support and the column, together with means for flexing said flexible



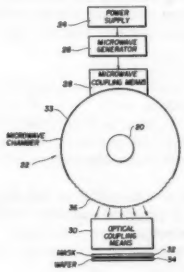
member to position said wafer support correctly with respect to the position of focus of the beam.

4,532,427

METHOD AND APPARATUS FOR PERFORMING DEEP UV PHOTOLITHOGRAPHY

John C. Matthews, Columbia; Michael G. Ury, Bethesda; Charles H. Wood, Rockville, and Marshal Greenblatt, Silver Spring, all of Md., assignors to Fusion Systems Corp., Rockville, Md.

Filed Mar. 29, 1982, Ser. No. 362,825
Int. Cl.³ H01J *65/04*
U.S. Cl. 250—492.2 **7 Claims**



1. An apparatus for performing deep UV photolithography in which deep UV radiation is emitted from a light source at brightness levels which are sufficient to provide exposure of a deep UV photoresist at an exposure plane at substantially faster exposure times than have been afforded with deep UV arc lamp photolithography systems, and wherein said light source at said high deep UV brightness levels has a relatively long lifetime and requires replacement at only relatively infrequent intervals, comprising,

microwave generated electrodeless light source means for emitting said deep UV radiation, wherein said light source means comprises,

(a) an envelope containing a plasma forming medium,

(b) microwave energy generating means for generating power at microwave frequencies,

(c) means for coupling said generated microwave power to said envelope at power densities of at least 250 (watts/cc), and

optical imaging means for imaging the bright deep UV radiation which is provided by said electrodeless light source at said exposure plane, for rapidly exposing a deep UV photoresist-coated substrate which may be disposed at said plane.

4,532,428

CONCRETE SHIELDING HOUSING FOR RECEIVING AND STORING A NUCLEAR FUEL ELEMENT CONTAINER

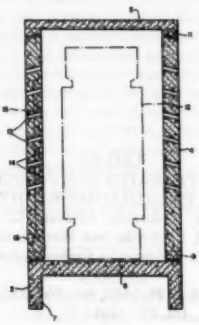
Hans-Peter Dyck, Burgdorf; Harry Spilker, Bad Muender, and Heinz-Dieter Gregor, Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,750

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143865

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—507.1 4 Claims



1. A concrete shielding housing for receiving and storing a transportable fuel element container which is suitable for storage and filled with spent nuclear reactor fuel elements, the housing comprising:

a base;

a concrete shielding wall disposed on said base; and,

a cover atop the shielding wall;

said shielding wall, said cover and said base conjointly defining an enclosed space having interior dimensions somewhat larger than the outer dimensions of the container, and

a plurality of detectors embedded in the concrete of said wall for detecting a physical quantity radiated from the container, said detectors being arranged in said wall spaced one from the other so as to permit a profile of said quantity to be detected.

4,532,429

METHOD AND APPARATUS FOR DETECTING THE LEADING EDGE OF A SHEET TO BE SCANNED

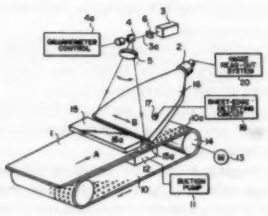
Kazuo Horikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 13, 1982, Ser. No. 408,049

Claims priority, application Japan, Aug. 19, 1981, 56-129809

Int. Cl.³ G01H *21/86*

U.S. Cl. 250—559 16 Claims



1. A method of detecting the leading edge of a sheet-like object to be scanned in an image scan system wherein main scanning of the sheet-like object is performed by making a beam of light oscillate back and forth with the aid of optical deflection means and sub-scanning of the sheet-like object is performed by moving the sheet-like object in the direction perpendicular to the main scanning, the method comprising:

oscillating a light beam back and forth in the main scanning direction at a predetermined frequency of oscillation;

moving the sheet-like object in the sub-scanning direction toward the oscillating light beam;

detecting the reflection of said beam of light from the leading edge of said sheet-like object;

decreasing the frequency of oscillation of said light beam upon detection of said reflection from the leading edge of said sheet-like object to perform the main scanning.

4,532,430

FAULT DETECTION APPARATUS FOR MATERIAL WEBS

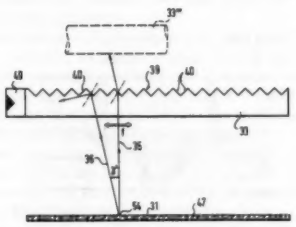
Dieter Röss, Planegg, and Klaus Ostertag, Munich, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Division of Ser. No. 235,694, Feb. 18, 1981, Pat. No. 4,450,359. This application Dec. 20, 1983, Ser. No. 563,602

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006072

Int. Cl.³ G01N *21/88*

U.S. Cl. 250—572 2 Claims



1. Fault detection apparatus for material webs comprising a light transmitting device for generating a line of light on the material web, said web having a width; and an elongate light receiving device extending parallel to the line of light and spaced therefrom to receive light scattered from said web in a reception plane containing said line and said elongate light receiving device, said light receiving device extending over at least said width of said web; wherein said light receiving device comprises a light conducting rod having a side surface and first and second end faces, an elongate light inlet extending along said side surface in said reception plane, a stepped prism arrangement in the form of a linear array of prism surfaces arranged along said side surface and disposed diametrically opposite to said light inlet, and at least one photoelectric converter at at least one of said end faces; and wherein said stepped prism arrangement is unmirrored and wherein the inclination of said prism surfaces is so selected that light beams which extend within a predetermined angular range with respect to said web in said reception plane and which enter said light inlet and fall on said stepped prism arrangement are transmitted through said stepped prism arrangement out of said rod, whereas received light beams extending outside of this angular range are incident on the prism surfaces at angles of total reflection and are reflected into the interior of said rod.

4,532,431

METHOD AND APPARATUS FOR PRODUCING ELECTRICAL ENERGY FROM A CYCLIC COMBUSTION PROCESS UTILIZING COUPLED PISTONS WHICH RECIPROCATE IN UNISON

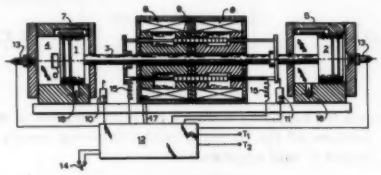
Maxim D. Iliev; Stoyu S. Kervanbashiev; Stefan D. Karamanski, and Frederik M. Makedonski, all of Sofia, Bulgaria, assignors to CUV "Progress", Sofia, Bulgaria

Filed Sep. 30, 1982, Ser. No. 431,119

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139357

Int. Cl.³ F02B *71/00;* **F02D** *39/10;* **H02P** *9/04*

U.S. Cl. 290—4 R **8 Claims**



1. A device for producing electrical energy from a cyclic combustion process, comprising two oppositely disposed aligned spark ignited internal combustion engine cylinders axially spaced from each other, a piston in each of the cylinders, means rigidly connecting the pistons so that they reciprocate in unison in their respective cylinders, means for alternately firing the two cylinders so as to reciprocate the piston system composed of the two pistons and the connecting means, a reciprocatory electrical generator-motor means driven by said reciprocatory piston system, said generator-motor means comprising a coil rigidly attached to and reciprocating with the said piston system and means creating a constant strength magnetic field within which the coil reciprocates, means to begin the combustion process in each combustion chamber at a low compression ratio sufficient for the initial ignition of the fuel-air mixture in transmitting an electric spark, to proceed at a diminishing volume under the influence of the opposite combustion chamber forces, and to terminate the combustion process at an expanding volume during the reverse piston stroke, whereby there is induced an electromotive voltage in the coil, a source of electrical current, and means which is switched on in the initial reciprocation of the piston system to energize the coil so that it drivingly reciprocates the piston system.

4,532,432

CONTROL CIRCUIT SYSTEM FOR AUTOMOBILES

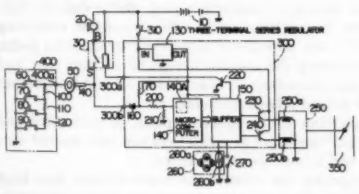
Yoshikazu Mizuno, Aichi, and Akira Ikuma, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 20, 1982, Ser. No. 380,252

Claims priority, application Japan, May 22, 1981, 56-77679; Nov. 12, 1981, 56-181591

Int. Cl.³ H02G *3/00;* **H02J** *1/00;* **H01H** *9/00*

U.S. Cl. 307—10 R **7 Claims**



1. A control circuit system for an automobile having a steering handle comprising:

command switch means having a plurality of command switches mounted on said steering handle including a horn switch, for producing a d.c. command signal corresponding respectively to each of said switches;

control circuit means for generating a respective control signal in response to each of said d.c. command signals from said command switch means;

power switch means for selectively rendering operative said control circuit means by supplying a voltage thereto from a battery of said automobile;

a normally-closed relay switch connected between said switch means and an electric horn of said automobile and controlled by said control signal of said control circuit means, said relay switch being connected to be turned on when said power switch means are turned off, and be turned off by said control circuit means when said power switch means are turned on, said relay switch operatively connecting said battery with said command switch means when said relay switch is turned on; and

signal coupling means for connecting said switch means and said control circuit means by a single signal line.

4,532,433

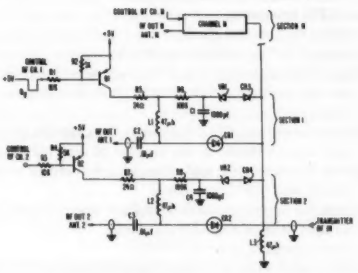
SWITCHING CIRCUIT WHICH IS SELF-BIASED IN ONE MODE OF OPERATION

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 6, 1982, Ser. No. 405,713

Int. Cl.³ H03K *17/56, 17/74*

U.S. Cl. 307—241. **9 Claims**



1. A switching circuit comprising:

a plurality of circuit paths, each path coupling an input terminal to a different one of a plurality of output terminals, each of said paths including a switching means exhibiting a low impedance in response to a first control signal and a high impedance in response to a second control signal, each switching means including a PIN diode;

control means coupled to each of said paths for supplying said first control signal to the switching means in a selected path;

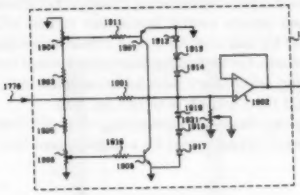
first means for supplying a source signal, to be passed through the selected path to the corresponding output terminal; and

second means responsive to said source signal for supplying said second control signal to the switching means in all of said circuit paths other than said selected path, said second means including a plurality of rectifying devices, each rectifying device being electrically connected to a corresponding PIN diode and responsive to said source signal for supplying said second control signal to reverse bias said corresponding PIN diode other than the PIN diode in the selected path.

4,532,434
WAVEFORM GENERATOR

James E. Layton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 305,291, Sep. 24, 1981, Pat. No. 4,443,713, which is a division of Ser. No. 105,041, Dec. 18, 1979, Pat. No. 4,305,274, which is a continuation of Ser. No. 955,843, Oct. 30, 1978, abandoned. This application Feb. 3, 1984, Ser. No. 576,845
Int. Cl.[3] H03K 3/80, 5/01
U.S. Cl. 307—261 1 Claim



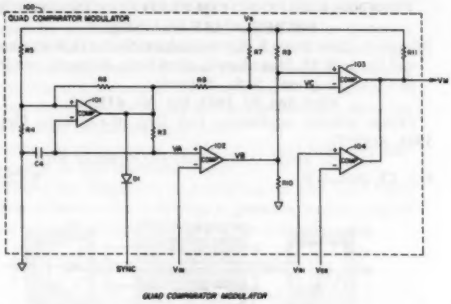
1. Apparatus for generating a sine wave comprising:
means for generating a triangular waveform;
a PNP transistor;
a first voltage divider network;
at least one first diode;
means for supplying said triangular waveform through said first voltage divider network to the base of said PNP transistor;
means for electrically connecting the anode of said at least one first diode to the emitter of said PNP transistor;
means for supplying said triangular waveform to the collector of said PNP transistor;
an NPN transistor;
at least one second diode;
a second voltage divider network;
means for supplying said triangular waveform through said second voltage divider network to the base of said NPN transistor;
means for electrically connecting the cathode of said at least one second diode to the emitter of said NPN transistor;
means for supplying said triangular waveform to the collector of said NPN transistor;
means for supplying said triangular waveform to the anode of said at least one second diode;
a potentiometer; and
means for electrically connecting the cathode of said at least one first diode and the anode of said at least one second diode to said potentiometer, wherein said sine wave is output from the electrical connection between said potentiometer, the cathode of said at least one first diode and the anode of said at least one second diode.

4,532,435
PULSE WIDTH MODULATOR HAVING NONLINEAR TRANSFER FUNCTION

Jonathan R. Wood, Sudbury, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Jul. 9, 1982, Ser. No. 396,590
Int. Cl.[3] H03K 3/017; G06G 7/12
U.S. Cl. 307—265 6 Claims

1. Apparatus for providing a pulse width modulated waveform responsive to an input voltage, said apparatus comprising:
oscillator means for generating an output signal, said signal having alternate first portions, during each of which the output signal rises along a first path from a first voltage value to a second voltage value, and second portions, during each of which the output signal falls along a second path from said second value to said first value, at least one of said paths being nonlinear;
means for comparing said output of said oscillator means with said input voltage; and

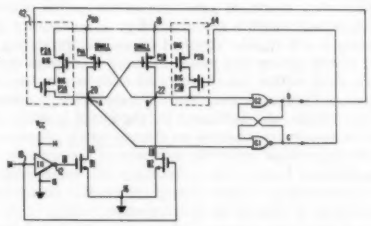


means for supplying a waveform representative of selected portions of the output of said comparing means to the output of said apparatus.

4,532,436
FAST SWITCHING CIRCUIT

Otto H. Bismarck, Woodbridge Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1983, Ser. No. 537,817
Int. Cl.[3] H03K 3/037, 3/356, 5/12, 19/017
U.S. Cl. 307—279 13 Claims



1. In a circuit in which first and second switching transistors driven by complementary input signals, have their conduction paths connected between first and second outputs, respectively, and a first power terminal, and in which relatively high impedance loads are connected between the outputs and a second power terminal, whereby the signals at said outputs tend to be unsymmetrical going from a second level, approximately equal to the voltage at said second power terminal, to a first level, approximately equal to the voltage at said first power terminal, much faster than from said first level to said second level, means for rendering the signal at said first and second outputs more symmetrical, comprising:
first, second, third and fourth load transistors, each load transistor having a conduction path and a control electrode, and the load transistors when turned-on exhibiting a relatively low impedance along their conduction paths;
means connecting the conduction paths of said first and second load transistors in series between said first output and said second power terminal;
means connecting the conduction paths of said third and fourth load transistors in series between said second output and said second power terminal;
means connecting the control electrode of said first load transistor to said second output and the control electrode of said third load transistor to said first output; and
bistable means coupled between said first and second outputs and the control electrodes of said second and fourth load transistors responsive to the signal at said first output

being at said first level for turning-off said fourth load transistor and turning-on said second load transistor and responsive to the signal at said second output being at said first level for turning-off said second load transistor and turning-on said fourth load transistor.

4,532,437

SPEED-DEPENDENT SIGNAL GENERATOR

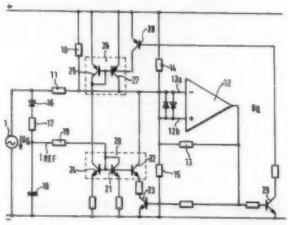
Bernd Bodig, Leinfelden; Hermann Kull, Stuttgart, and Richard Schleupen, Ingersheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 466,851

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208262

Int. Cl.³ H03K *5/153*

U.S. Cl. 307—358 **3 Claims**



1. Apparatus for generating, from the periodic voltage (U_G) of an inductive rotary generator, a signal sequence (U_Q) dependent upon rotary speed, comprising:

a voltage threshold switch stage **(12)** comprising an operational amplifier having its inverting input **(12*a*)** connected for receiving said periodic voltage (U_G);

means for producing a reference current (I_{REF}) corresponding to the average absolute value of said periodic voltage (U_G), and

at least one current mirror **(20, 26)** connected for being supplied with said reference current (I_{REF}) and for shifting the potential of said inverting input **(12*a*)** of said operational amplifier **(12)** in response to said reference current, and thereby compensating the operation of said operational amplifier as a threshold switch for the inherent timing shift produced by changes in amplitude of said periodic voltage (U_G).

4,532,438

MONOLITHICALLY INTEGRABLE MOS-COMPARATOR CIRCUIT

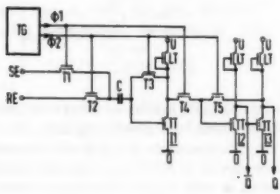
Robert Reiner, Lynn East, South Africa, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,142

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130391

Int. Cl.³ H03K *5/24*

U.S. Cl. 307—362 **2 Claims**



1. Circuit of a monolithically integrable MOS-comparator for comparing a signal voltage applied to a signal input of the comparator with a reference voltage applied to a reference input of the comparator including a plurality of serially connected amplifier stages connected in parallel with respect to a supply voltage, comprising a capacitor having a first and a second pole, the signal input and the reference input of the comparator being alternatingly connected to said first pole of said capacitor via respective first and second clock-controlled transfer transistors, a first one of the amplifier stages being formed as an inverter and having a control input and an output, said second pole of said capacitor being directly connected to said control input of said first amplifier stage and being also connected via a third transfer transistor to said output of said first amplifier stage, a second one of the amplifier stages also formed as an inverter and having a control input and an output, said output of said first amplifier stage being further connected via a fourth transfer transistor to said control input of said second amplifier stage, a third one of the amplifier stages also formed as an inverter and being identical with said first and second amplifier stages, said third amplifier stage having a signal input and an output, said output of said second amplifier stage being a first signal output of the comparator and being also connected to said signal input of said third amplifier stage, said output of said third amplifier stage being a second signal output of the comparator and being connected via a fifth transfer transistor to said control input of said second amplifier stage, and means for transmitting two clock signals connected to said first and second transfer transistors, respectively, for alternatingly switching the signal input and the reference input, respectively, of the comparator to said capacitor, said signals being matched with one another so that a pulse of one of said clock signals always appears in a pause between two consecutive pulses of the other of said clock signals, said signal-transmitting means being also connected to said third, fourth and fifth transfer transistors for controlling the same so that said connection of said capacitor to said output of said first amplifier stage, as well as said connection of said input of said second amplifier stage to said output of said third amplifier stage is controlled by said one clock signal, and said connection of said output of said first amplifier stage to said signal input of said second amplifier stage is controlled by said other clock signal.

4,532,439

MOSFET LOGICAL CIRCUIT WITH INCREASED NOISE MARGIN

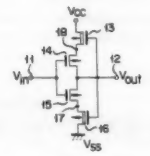
Hideharu Koike, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 2, 1983, Ser. No. 528,781

Claims priority, application Japan, Sep. 13, 1982, 57-158144

Int. Cl.³ H03K *19/094, 3/353;* **G11C** *11/40;* **H03B** *5/36*

U.S. Cl. 307—450 **8 Claims**



1. A logical circuit comprising:

a first circuit consisting of at least one MOSFET of a first conductivity type having a gate connected to an input terminal and having a first current path with one end connected to an output terminal;

a second circuit consisting of at least one MOSFET of a second conductivity type having a gate connected to said

input terminal and having a second current path with one end connected to said output terminal;

a depletion-type MOSFET of the second conductivity type interposed between another end of said first current path and a first power source, having a gate connected to said output terminal, and having a threshold voltage, the absolute value of which is larger than that of said at least one first conductivity-type MOSFET; and

a depletion-type MOSFET of the first conductivity type interposed between another end of said second current path and a second power source, having a gate connected to said output terminal, and having a threshold voltage, the absolute value of which is larger than that of said at least one second conductivity-type MOSFET.

4,532,440

FLIP-FLOP IN CURRENT MODE LOGIC CONTROLLED BY A TRANSFER CLOCK WITH AUXILIARY CURRENT APPLIED TO DIFFERENTIAL AMPLIFIER

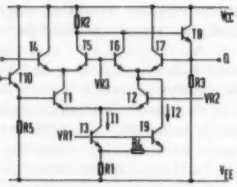
Claude Barre, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,750

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3146547

Int. Cl.³ H03K *3/23, 19/86, 3/13, 19/3*

U.S. Cl. 307—455 **3 Claims**



1. In a flip-flop for operation in the current mode logic technique and controlled by a transfer clock and of the type having a first differential amplifier with emitter-coupled transistors fed by a primary current source connected between an operating potential and the emitters of the emitter-coupled transistors, and second and third differential amplifiers each having emitter-coupled transistors whose emitters are connected to respective collector circuits of the emitter-coupled transistors of the first differential amplifier, and in which the transfer clock is applied to the base of a first emitter-coupled transistor of the first differential amplifier and in which the base of the second emitter-coupled transistor of the first differential amplifier is connected to a fixed reference potential, the improvement therein comprising:

an auxiliary current source for producing an auxiliary current, said auxiliary current source being connected between the emitters of the emitter-coupled transistors of the third differential amplifier and the operating potential and providing a current of 5%–10% of the primary current supplied by the primary current source.

4,532,441

OUTPUT STAGE FOR A TEMPERATURE-COMPENSATED INTEGRATED E.C.L. CIRCUIT

Gilbert Y. M. Gloaguen, Evrecy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1982, Ser. No. 451,995

Claims priority, application France, Dec. 30, 1981, 81 24475

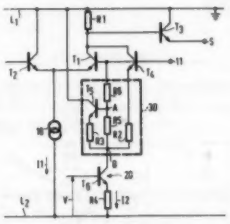
Int. Cl.³ H03K *19/086, 19/20, 17/14*

U.S. Cl. 307—455 **7 Claims**

1. An output stage for an integrated E.C.L. circuit, said output stage comprising:

a first and a second transistor which are interconnected by way of their emitters and which form a differential circuit which is connected to a first power supply line and which is connected in series with a first current source to which the emitters of both transistors are connected and which is connected to a second power supply line, a selected one of the base zones of said first and second transistors forming the input of said stage, the collector of the first transistor being connected to the first power supply line via a first resistor and the collector of the second transistor being connected to said first power supply line;

a third transistor whose emitter forms the output of the circuit and whose base is connected to said first resistor and to the collector of the first transistor and whose collector is connected to a third power supply line;



a fourth transistor whose base and collector are connected in parallel with the base and the collector, respectively, of the first transistor and whose emitter circuit comprises a second current source which is connected to the second power supply line, characterized in that a second resistor is connected between the second current source and the emitter of the fourth transistor, a third resistor being connected in series with the emitter-collector path of a fifth transistor between said second current source and the first power supply line, the collector of the fifth transistor being directly connected to said first power supply line while its base is coupled to the emitter of the fourth transistor.

4,532,442

NOISE REDUCTION IN ELECTRONIC MEASURING CIRCUITS

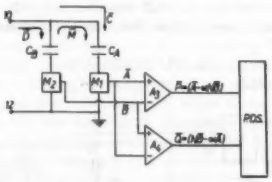
Ian A. Black, Hunters Lodge, Beechwood La.,, Cooksbridge, Lewes, East Sussex, England

Filed Oct. 19, 1982, Ser. No. 435,205

Claims priority, application United Kingdom, Oct. 23, 1981, 8131996

Int. Cl.³ H03K *17/16*

U.S. Cl. 307—520 **5 Claims**



2. In a pulse detection system of the type wherein signals ($\overline{A}$) and ($\overline{B}$) obtained from two monitoring units (M_1, M_2) in series with respective components (C_A,C_B) are compared in a pulse discrimination device in order to detect the occurrence of out of phase pulses in said signals, the improvement comprising difference amplifier means coupled to said monitoring units for providing input signals ($\overline{P}$) and ($\overline{Q}$) for the pulse discrimination device given by: $\overline{P}=(\overline{A}-\alpha N\overline{B})$ and $\overline{Q}=(N\overline{B}-\alpha\overline{A})$ wherein α

lies in the range of 0.5 to 1.0 and (N) is chosen to make the difference signal $(\overline{A} - N\overline{B})$ a minimum.

4,532,443

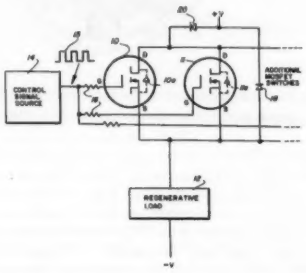
PARALLEL MOSFET POWER SWITCH CIRCUIT

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 27, 1983, Ser. No. 507,737

Int. Cl.³ H03K *17/687, 3/01*

U.S. Cl. 307—575 **3 Claims**



1. A power switching circuit for switching power from a DC supply to a regenerative load, comprising:

a plurality of power MOSFETs each having source, drain and gate elements with the source-drain circuits parallel connected between the DC supply and the regenerative load, each of said MOSFETs having an inherent reverse diode junction between the source and drain elements;

a control signal source having a switching control signal output connected with the gate element of each MOSFET, switching the MOSFET source-drain circuits on and off at a selected rate;

a first diode connected in parallel with the source-drain circuits of said power MOSFETs and poled to conduct reverse current from the load; and

a second diode connected in series with the source-drain circuits of said power MOSFETs and poled to block current flow through the reverse diode junctions of the MOSFETs, the series combination of the second diode and the source-drain circuits of the power MOSFETs being shunted by said first diode.

4,532,444

ROTATIONAL RESTRICTION LOCK FOR THE ROTOR OF A SYNCHRONOUS MOTOR

Hermann Gerber, Münchenwiler, and Michel Schmutz, Murten, both of Switzerland, assignors to Sodeco-Saia AG, Murten, Switzerland

Filed May 4, 1983, Ser. No. 491,413

Claims priority, application Switzerland, Jun. 1, 1982, 3345/82

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—41 **10 Claims**

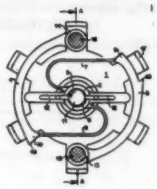
1. A rotational restriction lock for a rotor of a synchronous motor to assure a required direction of rotation, said motor including at least one fixed point,

comprising in combination,

said rotor including a shaft,

a one-piece rotation restricting member, including a hub member having at least one surface in resilient frictional engagement with said shaft,

at least one movable rotation restricting element movably supported on said fixed point, and



means resiliently connecting said restricting element to said hub member.

4,532,445

ROTOR OF SUPERCONDUCTIVE GENERATOR

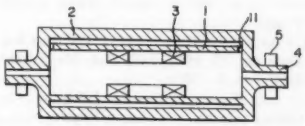
Masatami Iwamoto; Shiro Nakamura; Masayuki Miyazaki, and Sumio Yoshioka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 314,042, Oct. 22, 1981, abandoned, which is a continuation of Ser. No. 104,827, Dec. 18, 1979, abandoned. This application Feb. 2, 1984, Ser. No. 575,729

Claims priority, application Japan, Dec. 29, 1978, 53-161608

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—52 **15 Claims**



1. In a rotor of a superconductive generator having a torque tube in a damper, a shaft and a superconductive coil fitted to said torque tube, an improvement comprising:

said damper and said torque tube being formed in one piece without a movable part by directly and firmly connecting said damper and said torque tube to each other at each end of said torque tube by one of welding and bolting said damper to said torque tube;

said damper having a thickness at least two times the thickness of said torque tube such that the ratio of thermal stress to resistance in said torque tube is at least as great as that in said damper;

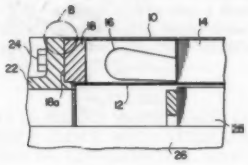
said torque tube having a heat insulating part; and

said torque tube having a coil fitting part wherein a thickness of said coil fitting part of said torque tube is thicker than a thickness of said heat insulating part.

4,532,446
SUBMERGED ELECTRIC MOTOR

Sakuei Yamamoto; Hiroshi Inao; Mitsuhiro Nishida; Matao Matsushita, and Hidemi Komoda, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,543
Claims priority, application Japan, Apr. 19, 1982, 57-66810
Int. Cl.³ H02K *5/10*
U.S. Cl. 310—87 2 Claims



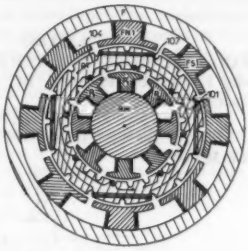
1. A submergible electric motor comprising:
an outer hollow cylinder of a corrosion resistant metal and having an iron stator core fixed on the inner surface thereof;
an end plate of a base metal and having the peripheral edge engaged with the inner surface of one end portion of said outer hollow cylinder and having an outer surface facing outwardly of the end of said hollow cylinder;
a bracket mounted against the outer surface of said end plate; and
a combined deposit metal and fused portion joining said end portion of said outer hollow cylinder and the peripheral edge of said end plate, said combined deposit metal and fused portion including the corrosion resistant metal as the deposit metal, said combined deposit metal and fused portion having an end surface flush with said outer surface of said end plate, said fused portion further having a peripheral surface extending around said end plate whereby the base metal of said end plate is isolated from water in which the motor is submergible by said combined deposit metal and fused portion and said bracket.

4,532,447
ROTARY ELECTRIC MACHINE FORMING MORE ESPECIALLY A SPEED VARIATOR OR A TORQUE CONVERTER

Pierre Cibié , 145 Avenue du Roule, 92200 Neuilly sur Seine, France

PCT No. PCT/FR82/00194, § 371 Date Jul. 21, 1983, § 102(e) Date Jul. 21, 1983, PCT Pub. No. WO83/02043, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 18, 1982, Ser. No. 522,151
Claims priority, application France, Nov. 25, 1981, 8122080
Int. Cl.³ H02K *16/00*
U.S. Cl. 310—114 13 Claims

1. A rotary electric machine comprising in combination:
a stator with s pairs of poles;
a central rotor with p pairs of poles;
an intermediate rotor comprising, at its inner face, at least one primary electric circuit subjected to the field of the central rotor and, at its outer face, at least one secondary circuit subjected to the field of the stator, characterized in that it comprises, incorporated in the intermediate rotor, an electric circuit providing the connection between the primary electric circuit and the secondary electric circuit, this connecting circuit comprising at least one switching device controlling the flow of the current in the secondary circuit, in a direction such that the torque exerted by the stator on the intermediate rotor is in the same direction as the torque exerted by the central rotor on the intermediate rotor, the control of this switching device being provided from at least one sensor detecting the position of the intermediate rotor with respect to the stator or to the field resulting from the energizing coils of the stator and the

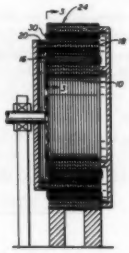


armature reaction produced in the intermediate rotor, said position sensor being also integrated in said intermediate rotor.

4,532,448
FLUX DIRECTOR, TOOTH SHIELD

Ross D. Welburn, Santa Rosa, Calif., assignor to Motornetics Corporation, Santa Rosa, Calif.

Filed Sep. 6, 1983, Ser. No. 529,596
Int. Cl.³ H02K *19/00*
U.S. Cl. 310—163 6 Claims

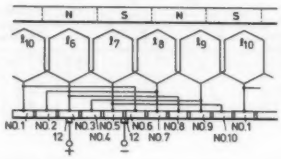


1. An electric motor of the type having a plurality of opposed pairs of stator pole pieces, each stator pole piece having a plurality of projecting teeth, a rotor movably positioned between the stator pole piece pairs and having corresponding teeth opposing the stator pole teeth, the stator pole pieces and the rotor being made of laminae of magnetic material extending in a series of parallel planes perpendicular to the length of the rotor, separate electric coils encircling each stator pole piece, the coils of opposing stator pole pieces being connected in pairs and wound so as to generate magnetic fluxes of opposite polarity transversely through the rotor wherein the improvement comprises magnetic flux guide laminae of non-magnetic, electrically conductive material arranged parallel to and interspersed between the rotor laminae to guide the magnetic flux generated by the coils diametrically through the rotor in planes perpendicular to its length.

4,532,449
DC MOTOR

Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,237
Claims priority, application Japan, Dec. 14, 1981, 56-201136
Int. Cl.³ H02K *3/00*
U.S. Cl. 310—198 3 Claims



1. A DC cored motor comprising a motor case, a rotary shaft supported by the motor case

an iron core armature fixed on the rotary shaft and having 2n+1 equally spaced protruding iron poles, where n is a whole number equal to or greater than 2;

said protruding iron poles respectively supporting armature coils, each armature coil being wound around a respective protruding pole with no overlapping of said coils;

a field magnet arranged around the outside of said armature coils and having 2n equally spaced poles;

a commutator mounted on said rotary shaft and divided into 2(2n+1) commutator segments for supplying said armature coils with electric power through a commutator brush;

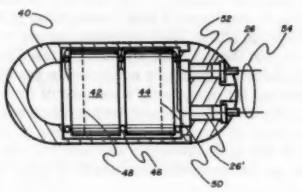
each alternate commutator segment being connected to one end of each of two coils which are separated from each other by an intermediate coil; and

each commutator segment being electrically connected to another commutator segment displaced therefrom by 180° around said commutator.

4,532,450
COMPOUND PIEZOELECTRIC ACCELEROMETER WITH RESIDUAL VOLTAGE MATCHING

William O. McNeel, and James A. Sackett, both of Houston, Tex., assignors to Litton Resources Systems, Inc., Alvin, Tex.

Division of Ser. No. 562,920, Dec. 19, 1983, Pat. No. 4,505,014.
This application Aug. 13, 1984, Ser. No. 640,300
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—329 3 Claims



1. In a compound accelerometer the improvement comprising:

a first and second simple accelerometer units, each simple accelerometer unit including

a. a hollow conductive open-ended case;

b. piezo-electric transducers sealing each end of said case to form a chamber, said piezo-electric transducers being oppositely polarized, one of said piezo-electric transducers being electrically dominant;

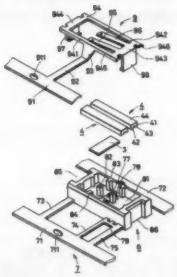
c. a sufficient volume of a conductive heavy liquid nearly filling said chamber; and

means for securing together said first and second simple accelerometer units, said first and second simple accelerometer units being matched as to residual voltage with the electrically dominant piezo-electric transducers of the simple accelerometer units facing in opposite directions.

4,532,451
TERMINALS AND MOUNTING FOR PIEZOELECTRIC RESONATORS

Jiro Inoue, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 23, 1983, Ser. No. 565,043
Claims priority, application Japan, Dec. 28, 1982, 57-230907; Dec. 28, 1982, 57-230908; Dec. 28, 1982, 57-202135[U]; Dec. 28, 1982, 57-202136[U]; Dec. 29, 1982, 57-234363
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—353 16 Claims



1. A piezoelectric resonator, comprising:

(A) a first terminal plate including:

(1) a first terminal having a contact portion and a lead portion electrically connected thereto;

(2) a shared terminal having a contact portion and a lead portion electrically connected thereto; and

(3) a second terminal having a contact portion and a lead portion electrically connected thereto, said shared terminal being electrically connected to said second terminal and being electrically insulated from said first terminal;

(B) a piezoelectric resonating element having an input electrode and an output electrode, said input electrode being in electrical contact with said contact portion of said first terminal, said output electrode being in electrical contact with said contact portion of said shared termianl; said piezoelectric resonating element further having a common electrode; and

(C) common electrode contact means including a contact portion and a lead portion electrically connected thereto, said contact portion of said common electrode contact means being in electrical contact with said common electrode.

4,532,452
CATHODE STRUCTURE FOR A CATHODOLUMINESCENT DISPLAY DEVICES

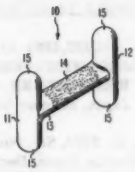
Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1983, Ser. No. 547,038
Int. Cl.³ A47B *88/00*
U.S. Cl. 313—346 R 4 Claims

1. A cathode for a cathodolumiscent display device comprising:

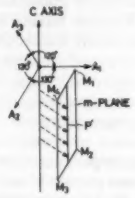
a plurality of substantially cylindrical, insulative support columns arranged in a substantially parallel spaced relationship, said columns being made of a material having a low coefficient of expansion;

a cathode heater member extending between and permanently affixed to said support columns;
a thin coating of high resistance metal on said columns and



on said cathode heater member for electrically connecting said columns and said heater member; and
an electron emissive coating on a portion of said cathode heater member between said columns.

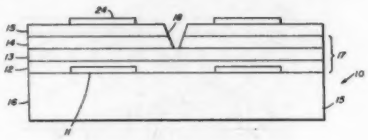
4,532,453
STORAGE TARGET FOR STORAGE TUBES AND METHOD OF FABRICATION
Takefumi Kato, Hinode, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1983, Ser. No. 553,483
Claims priority, application Japan, Dec. 3, 1982, 57-212374
Int. Cl.³ H01J *29/41*
U.S. Cl. 313—391 **9 Claims**



1. A storage target for a scan converter or other type of storage tube, comprising a storage substrate fabricated from a single crystal of sapphire, and a collector electrode having a directional pattern and formed on the storage substrate, the directionally patterned collector electrode being oriented at an angle ranging from about −45 degrees to about +45 degrees with respect to the projection of the c axis of the single sapphire crystal on the surface of the storage substrate bearing the collector electrode thereon.

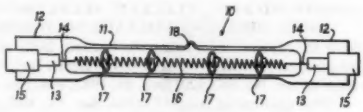
9. A method of fabricating a storage target for a scan converter or other type of storage tube, which comprises providing a storage substrate in the form of a single crystal of sapphire, the storage substrate having a storage surface, marking the storage substrate to indicate the direction of the projection of the c axis of the single sapphire crystal on the storage surface of the storage substrate, producing a directionally patterned collector electrode on the storage surface of the storage substrate with the directional pattern oriented at an angle ranging from about −45 degrees to about +45 degrees with respect to the direction of the projected c axis as indicated by the marking.

4,532,454
ELECTROLUMINESCENT DISPLAY HAVING DARK FIELD SEMICONDUCTING LAYER
Mohamed I. Abdalla, Los Angeles, Calif., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Sep. 16, 1983, Ser. No. 532,867
Int. Cl.³ N01J *1/62*
U.S. Cl. 313—506 **3 Claims**



1. An electroluminescent display comprised of:
a transparent substrate;
at least one transparent electrode supported by said substrate;
an electroluminescent laminate deposited over said transparent electrode;
a polycrystalline semiconducting layer of Si, GaAs, Ge, or InP deposited upon said electroluminescent laminate; and
at least one rear electrode deposited upon said semiconducting layer;
said rear electrode optically isolated from said electroluminescent laminate by said semiconducting layer.

4,532,455
TUNGSTEN HALOGEN INCANDESCENT LAMPS CONTAINING MIXED HALOGENS
Ian Connor, and Paul V. Crawshaw, both of Leicester, England, assignors to Thorn EMI plc, London, England
Filed Jun. 21, 1982, Ser. No. 390,792
Claims priority, application United Kingdom, Jun. 23, 1981, 8119368
Int. Cl.³ H01K *1/50*
U.S. Cl. 313—579 **5 Claims**

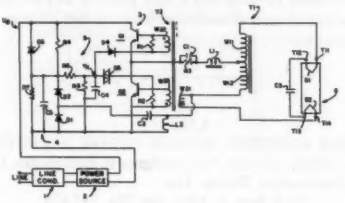


1. A tungsten halogen cycle electric incandescent lamp comprising an envelope of light transmitting refractory material, a filament within said envelope, means supporting the filament within the envelope and electric leads to the filament, said lamp further including a non reactive gas filling together with a further fill comprising a mixture of bromophosphonitrile and iodoform wherein said further fill comprises from 6 to 32 micrograms of bromophosphonitrile per cc of the internal volume of the lamp envelope and wherein the ratio of the iodoform to the bromophosphonitrile is from 1:1 to 5:1 by weight.

4,532,456
OUTPUT CIRCUIT FOR AN ELECTRONIC BALLAST SYSTEM
William C. Knoll, Turbotville, Pa., and David L. Bay, Beverly, Mass., assignors to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 397,265, Jul. 12, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,479
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—223 **3 Claims**

1. An electronic ballast circuit having a high frequency

push-pull inverter and an output circuit, said inverter providing an oscillatory drive signal to said output circuit and said output circuit including an interstage transformer with series-connected primary and secondary windings and a center tap coupled by a series-connected inductor and parallel-connected resistor and capacitor to said inverter, a feedback network having a winding in series connection with said primary and



secondary windings of said interstage transformer and coupled to said inverter, a set of first, second, third and fourth terminals formed for connection to a discharge lamp with said first and fourth terminals coupled to said primary winding of said interstage transformer and said winding of said feedback network respectively, and an impedance element coupled to said second and third terminals to provide an impedance shunting said discharge lamp.

4,532,457

TELEVISION RECEIVER STANDBY CIRCUIT

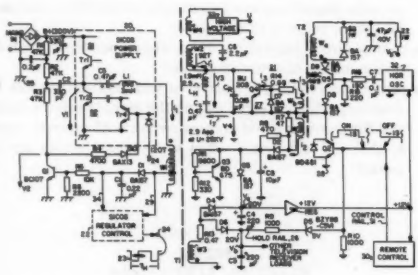
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed May 27, 1982, Ser. No. 382,493

Claims priority, application United Kingdom, Jan. 29, 1982, 8202664

Int. Cl.³ H01J *29/00*

U.S. Cl. 315—411 **22 Claims**



1. A television display system, responsive to the state of an ON-OFF command signal, comprising:

a deflection winding;

a deflection generator including a deflection output transistor means operable during normal mode to generate scanning current in said deflection winding;

a switching power supply deflection synchronized by operation of said deflection generator during normal mode for providing power to said television display system; and

means coupled to said deflection output transistor means and responsive to said ON-OFF command signal for providing base current thereto during the OFF-state of said command signal to substantially short-circuit said deflection generator during the OFF-state to change the operation of said switching power supply to a standby mode of operation.

4,532,458

VARIABLE-SPEED ELECTRICAL MACHINES

Stephen B. Kuznetsov, Pittsburgh, Pa., and Eric R. Laithwaite, Surbiton, England, assignors to National Research Development Corporation, London, England

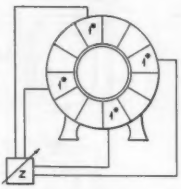
PCT No. PCT/GB81/00199, § 371 Date Apr. 30, 1982, § 102(e) Date Apr. 30, 1982, PCT Pub. No. WO82/01283, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 23, 1981, Ser. No. 375,267

Claims priority, application United Kingdom, Sep. 26, 1980, 8031128

Int. Cl.³ H02P *7/74*

U.S. Cl. 318—111 **4 Claims**



1. An alternating current electrical machine arrangement comprising:

a primary winding for connection to an alternating current electrical circuit of a predetermined frequency;

a secondary winding mounted in a spaced relationship with and for relative motion with respect to the primary winding an electrically isolated to define a flux permeable gap therebetween with relative motion between said primary and secondary windings coupling them by electromagnetic effects;

said primary and secondary windings formed of electrical conductors distributed in predetermined patterns along the extent of the flux permeable gap therebetween;

at least one of said predetermined patterns of electrical conductors having a non-regular and non-uniform portion along the flux permeable gap for creating and maintaining at least one transient of electromagnetic field conditions along at least portions of the flux permeable gap;

said at least one transient comprising a change from one effective field speed to another from point to point along the flux permeable gap;

said at least one of said predetermined patterns of conductors being provided by a winding including at least a first and a further separate part; and

means to alter a current in a said first part of a winding whereby at least one of said effective field speeds is altered to vary the speed of the machine.

4,532,459

LAUNDERING APPARATUS, METHOD OF OPERATING A LAUNDRY MACHINE, CONTROL SYSTEM FOR AN ELECTRONICALLY COMMUTATED MOTOR AND METHOD OF OPERATING AN ELECTRONICALLY COMMUTATED MOTOR

David M. Erdman, and Harold B. Harms, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 141,268, Apr. 17, 1980, Pat. No. 4,390,826, which is a continuation-in-part of Ser. No. 077,776, Sep. 21, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 400,319

Int. Cl.³ H02P *5/06*

U.S. Cl. 318—138 **91 Claims**

1. A laundering apparatus comprising in combination:

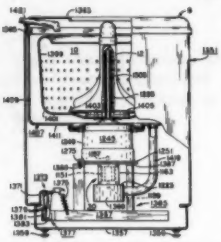
at least one rotatable device for being driven in forward and reverse strokes of agitation;

an electronically commutated motor including a stationary assembly having a plurality of winding stages associated

therewith and adapted to be selectively commutated, and rotatable means associated with said stationary assembly in selective magnetic coupling relation with said winding stages and adapted for driving said at least one rotatable device upon the electronic commutation of said winding stages;

means for commutating said winding stages by applying a voltage thereto in at least one preselected sequence during successive commutation periods;

means for controlling the voltage applied to said winding stages by said commutating means so that the applied voltage varies as a function of an input signal thereto; and



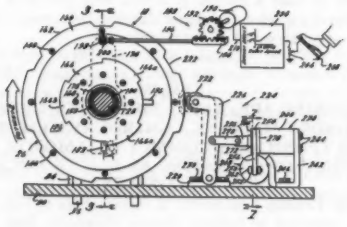
means for selectively generating one of a plurality of electrically varying signals, corresponding to one of a plurality of waveshapes to which the strokes of agitation are to be selectively made to conform, as the input signal to said controlling means, each of the strokes of agitation having substantially the same duration as the selectively generated one electrically varying signal, the input signal being variable over many commutation periods in accordance with the selected waveshape substantially independently from any variation of the applied voltage during any one of the commutation periods.

4,532,460

PRE-START ROTOR POSITIONER FOR AN ELECTRIC VEHICLE

Allan R. Gale, Allen Park, and Richard Chute, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 12, 1982, Ser. No. 397,261
Int. Cl.³ H02P 3/04; H02K 7/10
U.S. Cl. 318—139 **21 Claims**



1. An improved drivetrain of the type adapted for use with an electric vehicle having at least one tractive wheel and a motor including a stator and rotor for imparting torque to said wheel upon the energization thereof, said improvement comprising:

means operable for rotation with said rotor and defining an engagement surface; and

actuator means comprising,

(i) pawl means displaceable between a retracted position spaced from said engagement surface and an extended position wherein said pawl means contacts said engagement surface to substantially prohibit rotation of said rotor,

(ii) means biasing said pawl means toward said extended position,

(iii) means operable to urge said pawl means into said retracted position independently of rotor position in response to an actuation signal, and

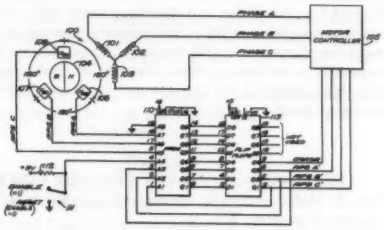
(iv) latch means including a member displaceable between a release position and a lock position to lock said pawl means in said extended position in the absence of said actuation signal.

4,532,461

ROTOR POSITION SENSOR ERROR DETECTION

James C. Crook, Raleigh, N.C., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Nov. 1, 1983, Ser. No. 547,638
Int. Cl.³ H02P 6/02
U.S. Cl. 318—254 **8 Claims**



1. A brushless D.C. motor control system comprising:

a brushless D.C. motor which includes a stator having a plurality of windings and a rotor;

a plurality of position sensors disposed about said rotor to provide digital position signals indicative of the position of said rotor relative to said stator;

a control circuit responsive to the digital position signals for commutating said windings; and

a protection circuit responsive to said position sensors for detecting a logical error among the digital position signals and for providing said control circuit with an error signal to shut off said motor when such logical errors are detected.

4,532,462

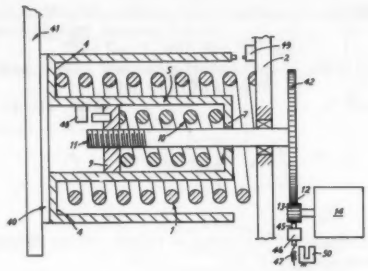
ELECTRIC ACTUATORS

Jack Washbourn, Chippenham, and Howard F. Cogan, Leire, both of England, assignors to Westinghouse Brake & Signal, England

Filed May 7, 1984, Ser. No. 607,635
Claims priority, application United Kingdom, May 12, 1983, 8313102; Jun. 23, 1983, 8317063; Jun. 23, 1983, 8317064
Int. Cl.³ H02K 7/10
U.S. Cl. 318—372 **7 Claims**

1. An electric actuator comprising an electric motor for controlling the output force generated by a spring system of the actuator on an output member of the actuator; measuring means responsive to the length of a spring of the spring system and comprising two parts, one of said parts carrying a series of switches for controlling the operation of the electric motor, and the other of said parts carrying a cam for sequentially operating said switches; and an electrical circuit for initiating the operation of the electric motor and for, responsive to said

measuring means, terminating the operation of said electric motor when the measuring means detects a length of said



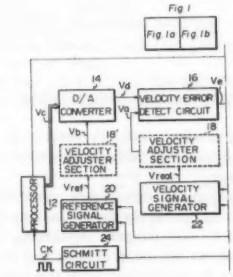
spring as being indicative of the output force being of a required value.

4,532,463

METHOD AND APPARATUS FOR ADJUSTING OPERATION TIME OF SERVOSYSTEM

Hidetake Tanaka, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,094
Int. Cl.³ G05B 5/01
U.S. Cl. 318—616 **17 Claims**



1. A method of adjusting an operation time for performing a predetermined operation of a servosystem into a predetermined allowable range, comprising the steps of:

(a) driving the servosystem for performing the operation according to a predetermined operation pattern;

(b) calculating an average operation time of the servosystem;

(c) calculating an amount of level shift from the resulting average operation time;

(d) shifting the operation time of the servosystem stepwisely during a given time interval based on the resulting amount of level shift;

(e) re-calculating an average operation time of the servosystem after the shift in step (d); and

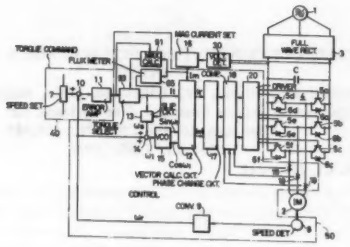
(f) repeating the calculation of an average operation time until the average operation time is brought into the allowable range.

4,532,464

CONTROL APPARATUS FOR INDUCTION MOTOR

Sadayuki Igarashi, Funabashi; Hiroshi Nagase, Hitachi; Hisakazu Ninomiya, Funabashi; Sumio Kobayashi, Funabashi, and Hiroyuki Tomita, Funabashi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Keiyo Engineering Co., Ltd., both of Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,864
Claims priority, application Japan, Dec. 27, 1982, 57-226889
Int. Cl.³ H02P 5/40
U.S. Cl. 318—807 **9 Claims**



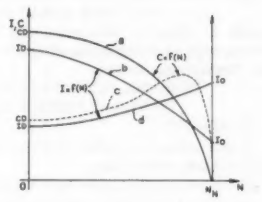
1. In a control apparatus for an induction motor wherein frequency conversion means is connected between a power source and the induction motor so as to energize the induction motor through the frequency conversion means; a control apparatus for an induction motor comprising voltage detection means for detecting a magnitude of an input voltage of said frequency conversion means, magnetizing current component command means for setting a magnetizing current component command of the induction motor in accordance with the detected information of said detection means so as to reduce a magnetizing current component when said detection means detects lowering of the input voltage, torque current component command means for setting a torque current component command of the induction motor in accordance with the detected information of said detection means, and control means for causing said frequency conversion means to control primary current of the induction motor so as to aim at the values instructed by said torque current component command means and said magnetizing current component command means.

4,532,465

ELECTROTECHNICAL DEVICE FOR REGULATING ASYNCHRONOUS ROTATING MACHINES

Michel Renard, Fleac, France, assignor to Moteurs Leroy-Somers, Angouleme, France

Filed Jul. 12, 1983, Ser. No. 513,004
Claims priority, application France, Jul. 16, 1982, 82 12443
Int. Cl.³ H02P 5/40
U.S. Cl. 318—814 **14 Claims**



1. An electrotechnical device for regulating asynchronous rotating machines having a plurality of windings, comprising

(a) a plurality of capacitors connected in series with the plurality of windings, respectively, the capacitance of said capacitor associated with each winding being such that the coefficient of capacitance (1/Cw) is substantially greater than the coefficient of inductance (Lw) corresponding with the associated winding; and

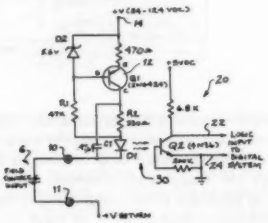
(b) variable impedance short circuit means connected in parallel with at least one of the windings, whereby the torque of the asynchronous rotating machine is modified, thereby to regulate the speed of rotation.

4,532,466

CONSTANT CURRENT SOURCE FOR FIELD CONTACT INPUT

Leonard R. Polinski, Jr., Lakewood, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 16, 1982, Ser. No. 408,545
Int. Cl.³ G05F *3/08*
U.S. Cl. 323—311 **5 Claims**



1. A constant current source for a field contact input comprising:

a terminal adapted to be connected to a variable source of DC voltage in a selected voltage range;

a transistor having an emitter connected to the terminal for forward biasing an emitter to base junction thereof;

a Zener diode connected between said transistor base and said terminal;

a light emitting diode connected between the collector of said transistor and the field contact;

a resistor of selected resistance connected between said base and said light emitting diode, whereby substantially constant current flows across the emitter to collector junction of said transistor for any voltage in the selected voltage range; and

an optically isolated monitoring circuit optically coupled to said light emitting diode for applying a logic signal to a digital control system.

4,532,467

CMOS CIRCUITS WITH PARAMETER ADAPTED VOLTAGE REGULATOR

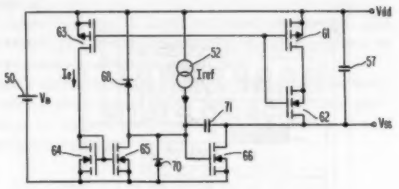
Kornelis A. Mensink, Brummen, and Hendrik L. Brouwer, Dieren, both of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Filed Mar. 14, 1983, Ser. No. 475,025
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—316 **27 Claims**

1. A self adjusting voltage regulator circuit for use with CMOS circuits, comprising

a reference complimentary MOS transistor pair with a predetermined geometry, and connecting means for connecting the transistors of said pair so that they are both conducting,

current means for driving a reference current through said reference pair to operate the MOS transistors of said pair within a predetermined operating range, and



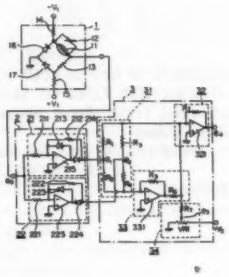
output means for delivering an output voltage developed across said CMOS pair.

4,532,468

TEMPERATURE-COMPENSATING VOLTAGE GENERATOR CIRCUIT

Haruki Nishida, Yokohama, and Yasuhiro Yano, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 22, 1983, Ser. No. 525,463
Claims priority, application Japan, Aug. 27, 1982, 57-149476
Int. Cl.³ H03H *1/00*
U.S. Cl. 323—367 **10 Claims**



1. A temperature-compensating voltage generator circuit, comprising:

temperature-sensing means for generating an electric signal whose voltage level varies in accordance with a temperature change;

discriminating means, operatively connected to said temperature-sensing means, for discriminating said electric signal generated by said temperature-sensing means by using a predetermined reference voltage and for generating output signals in accordance with the voltage level of said electric signal;

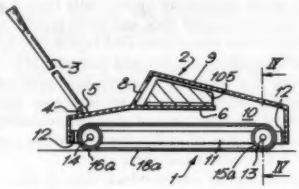
distributing and combining means, operatively connected to said discriminating means, for distributing each of said output signals of said discriminating means into a plurality of distribution signals in accordance with a voltage ratio which is determined for each output signal and for generating a plurality of combined output signals, each output signal being generated by combining distribution signals distributed from each of said output signals of said discriminating means; and

coupling means, operatively connected to said distributing and combining means, for coupling said plurality of combined output signals of said distributing and combining means after inverting at least one of said plurality of combined output signals, and an output signal of said coupling means being used as a temperature-compensating voltage.

4,532,469
APPARATUS FOR CAPACITANCE OR DAMPNESS MEASUREMENTS

Gerald E. Wardell, Killaloe, Ireland, assignor to Rynhart Research Limited, Delgany, Ireland

Filed Sep. 3, 1982, Ser. No. 414,676
Claims priority, application Ireland, Sep. 10, 1981, 2109/81
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R 19 Claims



1. An apparatus for capacitance or dampness measurement in a substance having an exposed substantially flat surface which apparatus comprises:

a pair of substantially elongate co-planar electrodes electrically isolated from each other and defining a gap therebetween of at least 0.5 cm;

means for making a separate electrical connection from each said electrode to an electrode monitoring apparatus;

means for moving the electrodes on the surface to permit discreet or continuous measurements of capacitance or dampness to be taken;

wherein each said electrode comprises an electrically conductive polymeric material;

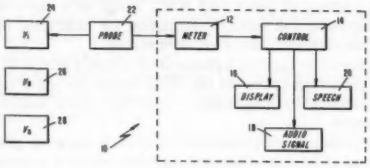
said means for moving each said electrode comprises a tracked vehicle having a pair of endless tracks thereon; and

each of said tracks functions as one of said electrodes.

4,532,470
READING SENSING METER

Thomas W. Wiesmann, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 22, 1982, Ser. No. 443,672
Int. Cl.³ G01R 19/00, 17/06; H03K 5/20
U.S. Cl. 324—76 R 18 Claims



1. An instrument comprising:

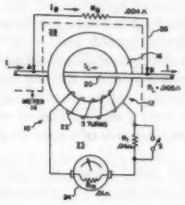
meter means for measuring signals provided thereto and providing readings representative thereof; and

control means responsive to said meter means for controlling said readings, said control means including means for storing successive first and second readings; means for determining a difference between said successive readings; means for establishing a reference low limit value and a reference high limit value; means for comparing said difference with said reference values; means for providing an output reading representative of the second reading when said difference is less than said reference low limit value; and means for updating the first reading when said difference is greater than said reference high limit value.

4,532,471
POWER THEFT DETECTION CIRCUIT

James R. Hurley, Brookfield, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed May 3, 1982, Ser. No. 373,984
Int. Cl.³ G01R 11/24, 1/20
U.S. Cl. 324—110 3 Claims



1. A method for detecting the theft of electric power by the insertion of a low resistance jumper connected in parallel with a section of line conductor through which electrical current flow is measured by a meter, comprising the steps of:

coupling the section of line conductor within the meter to a current transformer such that the section of line conductor forms a primary winding of said current transformer, said current transformer including a multi-turn secondary winding;

coupling said secondary winding into a secondary electrical circuit; and

electrically sensing a change in the impedance reflected into said secondary circuit from a primary circuit formed when the low resistance jumper is connected in parallel with the impedance of the section of line conductor forming said primary winding by:

(a) altering the impedance in said secondary electrical circuit by inserting and removing a pre-selected value of impedance in said secondary electrical circuit;

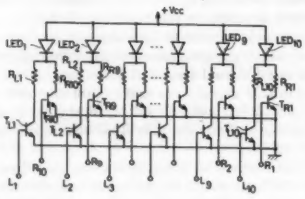
(b) measuring the current in said secondary electrical circuit before and after altering the impedance, and

(c) comparing the measured current before and after altering the impedance.

4,532,472
LED LEVEL METER

Yoshihide Ishino, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 282,239, Jul. 10, 1981, abandoned. This application Jun. 25, 1984, Ser. No. 623,550
Claims priority, application Japan, Jul. 16, 1980, 55-98069; Jul. 17, 1980, 55-98283
Int. Cl.³ G01R 19/00, 1/00
U.S. Cl. 324—122 11 Claims



1. A display system for displaying the levels of at least first and second input signals comprising:

a single array of display segments arranged in single file between a first and a second end thereof; and

a driver circuit responsive to said at least first and second input signals for selectively enabling said display segments, said drive circuit comprising:

first control responsive to said first input signal for determining the level thereof;

first drive means responsive to said first control means for enabling at least a selected display segment having a location corresponding to the level of said first input signal as counted from a first end of said array of display segments representative of a zero level of said first signal;

second control means responsive to said first input signal for determining the level thereof; and

second drive means responsive to said second control means for enabling at least a selected display segment having a location corresponding to the level of said second input signal as counted from a second end of said array of display segments representative of a zero level of said second signal;

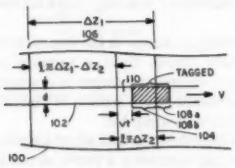
said first and second drive means thereby selectively enabling the same display segments within said single array.

4,532,473

NMR METHOD FOR MEASURING AND IMAGING FLUID FLOW

Felix W. Wehrli, Shorewood, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed May 18, 1983, Ser. No. 495,556
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—306 **32 Claims**



1. A non-invasive method employing NMR for measuring direction and magnitude of nuclear spin flow velocity within a vessel in an NMR sample, comprising sequentially the steps of:

(a) positioning said NMR sample in a substantially homogeneous magnetic field;

(b) tagging a plurality of nuclear spins in a slice of said sample, including nuclear spins in a portion of said vessel situated in said slice;

(c) exciting a plurality of nuclear spins in said slice to produce a first NMR signal originating substantially from said tagged nuclear spins situated in said slice and from untagged nuclear spins flowing in said vessel into said slice to replace at least some of the tagged nuclear spins flowing out of said slice;

(d) tagging a plurality of nuclear spins in a region of said sample which includes at least a part of said vessel, said region also including said slice and extending therefrom in a direction opposite to the direction of flow;

(e) exciting nuclear spins in said slice to produce a second NMR signal originating substantially from tagged nuclear spins situated in said slice and from tagged nuclear spins flowing in said vessel from said region into said slice; and

(f) utilizing said first and second NMR signals to determine the magnitude of nuclear spin flow velocity in said vessel through said slice.

14. An NMR method of imaging nuclear spin flow within a vessel of an NMR sample, comprising sequentially the steps of:

(a) positioning said NMR sample in a substantially homogeneous magnetic field;

(b) tagging a plurality of nuclear spins in a slice of said sample, including nuclear spins in a portion of said vessel situated in said slice;

(c) exciting a plurality of nuclear spins in said slice to produce a first NMR signal originating substantially from said tagged nuclear spins situated in said slice and from untagged nuclear spins flowing in said vessel into said slice to replace at least some of the tagged nuclear spins flowing out of said slice;

(d) tagging a plurality of nuclear spins in a region of said sample which includes at least a part of said vessel, said region also including said slice and extending therefrom in a direction opposite to the direction of flow;

(e) exciting nuclear spins in said slice to produce a second NMR signal originating substantially from tagged nuclear spins situated in said slice and from tagged nuclear spins flowing in said vessel from said region into said slice; and

(f) sampling each of said first and second NMR signals in the presence of at least one magnetic field gradient for encoding spatial information of nuclear spin distribution of stationary spins within said slice and including the distribution of nuclear spins flowing within the portion of said vessel contained in said slice; and

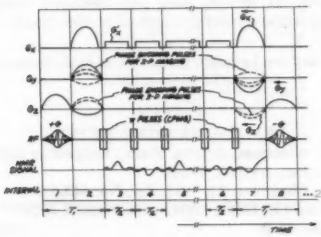
(g) constructing an image which depicts the nuclear spin distribution of spins flowing within said vessel, said image additionally depicting the relative position of said vessel in said slice.

4,532,474

NUCLEAR MAGNETIC RESONANCE IMAGING USING PULSE SEQUENCES COMBINING SELECTIVE EXCITATION AND DRIVEN FREE PRECESSION

William A. Edelstein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,810
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—309 **10 Claims**



1. A method of generating NMR image data using driven free precession and selective excitation for producing images having an increased data rate, comprising:

(a) selectively exciting a planar slice within a sample at a flip angle which optimizes the NMR signal for some ratio of transverse to longitudinal relaxation times within said sample;

(b) injecting a programmable amplitude imaging gradient along a first axis within said slice and injecting a dephasing gradient along a second axis within said slice and orthogonal to said first axis;

(c) applying an alternatingly phased series of 180° nonselective pulses to said sample at predetermined intervals to produce a corresponding series of spin echo signals in the intervals between said pulses, said intervals being significantly shorter than the transverse relaxation time in said sample;

(d) restoratively injecting imaging and rephasing gradients, said gradients being injected along respective axes corresponding to, and configured to be the negative versions of, those gradients of step (b); and

(e) said steps (a) selectively exciting, (b) injecting, (c) applying, and (d) restoratively injecting being done for each of a succession of projections, said programmable imaging

gradient being distinct for each said succession of projections and said intervals containing a predetermined imaging gradient along a second axis within said slice and orthogonal to said first axis which is substantially constant for all of said succession of projections.

4,532,475

IMPULSE NOISE REDUCTION BY LINEAR INTERPOLATION HAVING A DEEMPHASIS CHARACTERISTIC

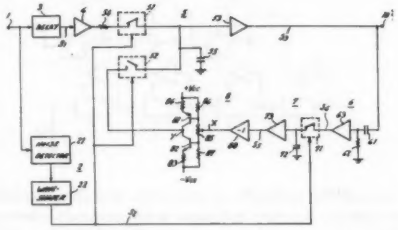
Yukinobu Ishigaki, Tokyo, and Kazutoshi Hirohashi, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 2, 1984, Ser. No. 585,925

Claims priority, application Japan, Mar. 9, 1983, 58-38467; Mar. 14, 1983, 58-42069

Int. Cl.³ H03B *1/04*

U.S. Cl. 328—165 **6 Claims**



1. A noise reduction circuit having an input terminal to which a high-frequency preemphasized analog audio signal is applied and an output terminal from which a noise-suppressed audio signal is delivered, comprising:

means coupled to said input terminal for generating a sampling pulse in response to an impulse noise introduced to said analog signal;

means having a resistor and a capacitor connected in a signal transmission path between said input terminal and said output terminal for deemphasizing said audio signal in the absense of said sampling pulse and disconnecting said transmission path at a point between said input terminal and said capacitor in the presence of said sampling pulse;

a differentiator coupled to the output of said deemphasis circuit for generating a signal representative of the slope ratio of the deemphasized analog signal;

a sample-and-hold circuit coupled to the output of the differentiator for sampling said slope ratio signal in response to said sampling pulse; and

means for linearly charging and discharging said capacitor at a rate variable as a function of the sampled signal in the presence of said sampling pulse.

4,532,476

POWER AMPLIFIER CAPABLE OF SIMULTANEOUS OPERATION IN TWO CLASSES

Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

Continuation of Ser. No. 278,717, Jun. 29, 1981,. This application Apr. 29, 1983, Ser. No. 489,915

Int. Cl.³ H03F *3/26*

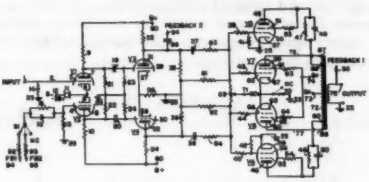
U.S. Cl. 330—123 **21 Claims**

1. An audio amplifier, primarily for audio power for musical instruments and sound reproduction systems including a plurality of electron discharge devices, each having a plurality of electrodes including an input electrode and an output electrode, at least two pairs of said electron discharge devices being connected in a push-pull parallel configuration,

first means for simultaneously applying an electrical signal to each of said input electrodes in common,

second means for connecting each of said output electrodes in common to a utilization device,

means biasing the electrodes of a first pair of said at least two pairs of electron discharge devices for Class A operation thereof, and



means biasing the electrodes of the second pair of said at least two pairs of electron discharge devices for operation in a class other than Class A to cause the onset of clip in said second pair to occur slightly after the onset of clip in said first pair.

4,532,477

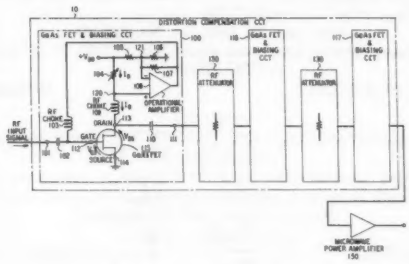
DISTORTION COMPENSATION FOR A MICROWAVE AMPLIFIER

Donald R. Green, Jr., North Andover, Mass., and James P. Moffatt, Salem, N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1983, Ser. No. 565,185

Int. Cl.³ H03F *1/32, 3/16*

U.S. Cl. 330—149 **14 Claims**



1. Apparatus for use in a communication system wherein an amplifier generates distortion known as amplitude modulation to phase modulation conversion in an input signal, said apparatus comprising

at least one GaAs field-effect transistor for receiving said signal, said transistor having gate, source and drain terminals; and

means for biasing said terminals independently of said input signal so that said transistor generates amplitude modulation to phase modulation conversion in said signal, said conversion having an algebraic sign opposite to that generated in said signal by said amplifier.

4,532,478

PHASE ADJUSTED FEEDFORWARD SYSTEM UTILIZING A SINGLE AMPLITUDE/PHASE EQUALIZER

Edward G. Silagi, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

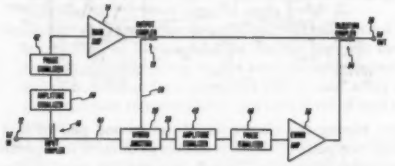
Filed May 30, 1984, Ser. No. 615,397

Int. Cl.³ H03F *1/26*

U.S. Cl. 330—151 **6 Claims**

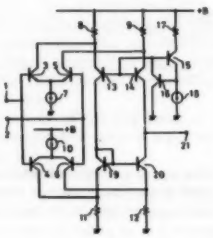
1. A phase adjusted feedforward amplifier system comprising:

means for providing an input signal;
means for sampling said input signal and providing a sampled input signal;
means for amplifying said sampled input signal and providing a main amplified output signal;
means for sampling said main amplified output signal for providing a sampled output signal;
means for phase and amplitude equalizing said sampled output signal to produce a phase and amplitude equalized sampled output signal;



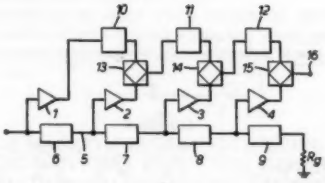
means for subtracting said sampled input signal from said phase and amplitude equalized sampled output signal to produce an error signal;
means for amplifying said error signal to produce a correction signal; and
means for subtracting said correction signal from said main amplified output signal to produce an amplified output of said input signal.

4,532,479
DIFFERENTIAL AMPLIFIER CIRCUIT WITH RAIL-TO-RAIL CAPABILITY
Robert A. Blauschild, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.
Filed Aug. 23, 1983, Ser. No. 525,181
Claims priority, application Japan, Sep. 9, 1982, 57-157246
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—261 **16 Claims**



1. A differential amplifier circuit comprising:
a pair of complementary first and second differential input portions for amplifying a differential input signal to produce (1) a first amplified differential signal taken between a pair of first and second terminals of the first input portion and (2) a second amplified differential signal taken between a pair of third and fourth terminals of the second input portion, the current signals at the first and third terminals being substantially opposite in phase; and
a pair of like-polarity first and second main amplifiers and a pair of like-polarity third and fourth main amplifiers complementary to the first and second amplifiers, each main amplifier having a first flow electrode, a second flow electrode, and a control electrode for controlling current transmission between the flow electrodes, the control electrodes of the first and second amplifiers connected together for receiving a bias voltage, the control electrodes of the third and fourth amplifiers connected together for receiving a control voltage dependent on the voltage at the second electrode of the first amplifier, the first electrodes of the first, second, third, and fourth amplifiers respectively coupled to the first, second, third, and fourth terminals, the second electrodes of the first and third amplifiers coupled together, and the second electrodes of the second and fourth amplifiers coupled together for supplying an output signal representative of the input signal.

4,532,480
HIGH POWER AMPLIFIER ARRANGEMENTS
Roger E. J. Gerard, Chelmsford, England, assignor to The Marconi Company Limited, Stanmore, England
Filed Sep. 6, 1983, Ser. No. 529,852
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—286 **9 Claims**

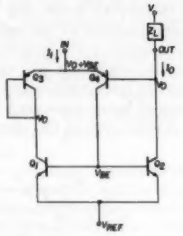


1. An amplifier arrangement including a plurality of amplifying devices having their individual input terminals connected to different points along an input delay line which has a predetermined passband; and the output terminals of the amplifying devices being connected to different points along an output line which consists of separate, sequentially connected delay stages each having an impedance and which have a predetermined passband; said points along the output line being so chosen that delays between the output terminals of a pair of amplifying devices are substantially the same as the delays between the input terminals of the pair of amplifying devices; and wherein the impedances of said delay stages progressively reduce as the sequence of delay stages approaches an output point at one end of the output line; and a power combiner positioned between each pair of adjacent delay stages and arranged to couple power from a respective amplifying device into said output line, said power combiner incorporating a load in which power is dissipated only if the powers fed to the two inputs of the power combiner are not in a predetermined proportion and phase.

4,532,481
HIGH VOLTAGE CURRENT MIRROR
Peter J. Meza, Melbourne Beach, Fla., and Alex de la Plaza, Bergamo, Italy, assignors to Harris Corporation, Melbourne, Fla.
Filed Jun. 14, 1983, Ser. No. 504,312
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—288 **9 Claims**

1. A current mirror comprising:
an input transistor and an output transistor each having a base, collector and emitter;
said emitters of said inut and output transistors being connected to a reference terminal;
said bases of said input and output transistors being connected together;
an input terminal connected to said collector of said input transistor;
an output terminal connected to said collector of said output transistor;
transdiode means connected between said input and output terminals and said input and output transistors bases for

maintaining the voltage at said output transistor's collector substantially equal to the voltage at said input transis-



tor's collector and providing current to said input and output transistor bases as a function of the input current.

4,532,482

CIRCUIT FOR PREVENTING MALFUNCTION OF MUTING AMPLIFIER

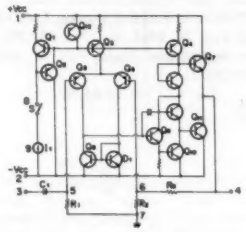
Tadashi Noguchi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,396

Claims priority, application Japan, May 17, 1982, 57-081659

Int. Cl.³ H03F *3/14*

U.S. Cl. 330—307 **3 Claims**



1. A circuit for preventing malfunction of a muting amplifier composed of a semiconductor integrated circuit which comprises a first lateral p-n-p transistor to receive an input signal applied to the base thereof and at least one second lateral p-n-p transistor serving as a constant current source and performing an amplifying operation during the conduction of said second lateral p-n-p transistor or is placed in a muting mode during the cutoff thereof, said circuit characterized in that a third lateral p-n-p transitor is provided in the vicinity of said first laternal p-n-p transistor and is connected such that said second lateral p-n-p transistor is turned off during the conduction of said third laternal p-n-p transistor, and when the input signal level becomes lower than the minimum potential in the integrated circuit, said third lateral p-n-p transistor is turned on by an n-p-n transistor.

4,532,483

COAXIAL RF MATCHING TRANSFORMER HAVING LINE SECTIONS SIMULTANEOUS ADJUSTABLE WHILE RETAINING A FIX TRANSFORMER LINE LENGTH

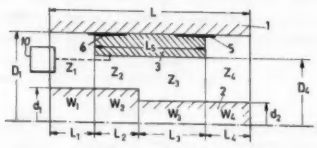
Wolfram Schminke, Laufenburg, Fed. Rep. of Germany, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 18, 1983, Ser. No. 495,832

Claims priority, application Switzerland, Jun. 4, 1982, 3466/82

Int. Cl.³ H03H *7/38*

U.S. Cl. 333—34 **4 Claims**



3. A radio-frequency matching transformer comprising:

a coaxial line including outer and inner conductors, said coaxial line having a fixed length and being subdivided into four line sections with respective line section lengths and characteristic impedances, wherein at least three of said characteristic impedances d:ffer from each other; and

means for simulaneously adjusting said four line section lengths;

wherein the sum of said four line section lengths remain constant and equals said fixed length.

4,532,484

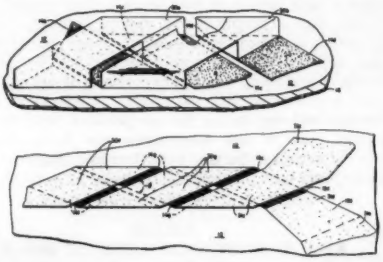
HYBRID COUPLER HAVING INTERLACED COUPLING CONDUCTORS

Yusuke Tajima, Acton, and Aryeh Platzker, Belmont, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 9, 1982, Ser. No. 440,478

Int. Cl.³ H01P *5/18*

U.S. Cl. 333—116 **21 Claims**



1. A radio frequency circuit comprising:

a ground plane conductor;

a pair of strip conductors, each strip conductor having first lower surface portions spaced a first predetermined distance from said ground plane conductor, and second lower surface portions spaced a second different predetermined distance from said ground plane conductor, with the first lower surface portions of one of the strip conductors being electromagnetically coupled to corresponding surface portions of the second one of the strip conductors.

4,532,485

FINE ADJUSTING MECHANISM FOR PRESET TYPE TUNER

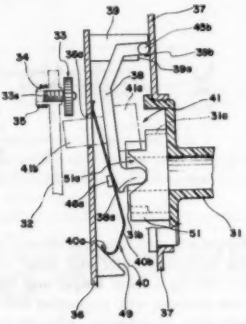
Katsuo Ito, Kanazawa; Kazunori Yoshimura, Ishikawa; Kazuhiro Tsuji, and Kazuo Kontani, both of Kanazawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 12, 1983, Ser. No. 560,760

Claims priority, application Japan, Dec. 17, 1982, 57-191730[U]

Int. Cl.³ H03J *5/28*

U.S. Cl. 334—51 **4 Claims**



1. In a preset type tuner which employs a clutch mechanism arranged to rotate a fine adjusting shaft for transmitting the rotation thereof to gears having threaded portions for local oscillation frequency adjustment each provided on a preset plate, a fine adjusting mechanism which comprises a lever pivotally supported by a support portion provided on a tuner frame and the like, a transmission gear having a first gear engageable with a gear provided on the fine adjusting shaft and a second gear engageable with each of said gears having threaded portions, and rotatably mounted on said lever, a drum portion coaxially provided at the end of said fine adjusting shaft at the side of the tuner frame, a ring having cam portions formed by cutting a peripheral edge of a cylinder at its one open end into approximately a triangular shape towards the other open end of the cylinder to provide the cam portions, and fitted under pressure onto said drum portion so as to be rotatable together with said fine adjusting shaft, and also to be slipped with respect to said drum portion against a torque higher than a predetermined degree, actuating projections formed on said lever and adapted to contact under pressure the cam surface of the cam portions of said ring by spring force acting on said lever, whereby the rotation of said fine adjusting shaft is converted into the pivotal movement of the lever through said ring having the cam portions, with the first and second gears of said transmission gear being respectively adapted to engage the gear of the fine adjusting shaft and each of the gears with the threaded portions.

4,532,486

REMOTE CONTROLLED CIRCUIT BREAKER

Gérard Terrier, St. Martin D'Heres, France, assignor to Merlin Gerin, Grenoble Cedex, France

Filed Oct. 27, 1983, Ser. No. 546,434

Claims priority, application France, Nov. 3, 1982, 82 18551

Int. Cl.³ H01H *71/10*

U.S. Cl. 335—13 **9 Claims**

1. A low voltage circuit breaker comprising:

a movable contact;

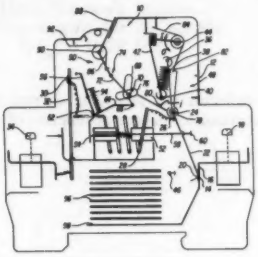
a tilting contact arm carrying said movable contact;

a stationary contact engageable in a closed circuit position with said movable contact;

a toggle spring movable between two positions for moving said contact arm alternately into either of two stable positions, one to close the contacts, the other to open them;

a heavy duty remote control mechanism having a pivoting rocker arm for moving said toggle spring between its two positions, thereby to move said contact arm from the closed circuit position to the open circuit position, and vice-versa, responsive to a remote control signal;

an automatic overload/fault trip mechanism movable between a latched reset position and a tripped position, said trip mechanism being connected to said contact arm to move the contact arm to the open circuit position upon



the occurrence of a predetermined overload/fault condition, said trip mechanism including:

a trip spring having a higher spring constant than said toggle spring for moving the movable contact arm to the open position and for holding it there regardless of the position of the toggle spring whenever the trip mechanism is in the tripped position; and

a trip mechanism manual resetting component for resetting said trip mechanism to the latched reset position after a tripping again to allow remotely controlled operation of the circuit breaker by changing of the position of the toggle spring.

4,532,487

RELAY STRUCTURE

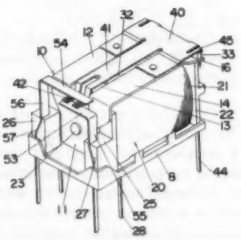
Mitsuki Nagamoto, and Takuo Kubota, both of Mie, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 24, 1984, Ser. No. 583,384

Claims priority, application Japan, Feb. 28, 1983, 58-32339; May 31, 1983, 58-82363

Int. Cl.³ H01H *45/02*

U.S. Cl. 335—128 **3 Claims**



1. A relay structure comprising in combination:

a generally L-shaped yoke comprising an upright yoke leg and an upper yoke member substantially at right angle thereto, said upper member being formed with a longitudinally extending slot which is open at both longitudinal ends and divides the upper yoke member into lateral side segments;

an energizing coil including a solenoid winding on a core

which is disposed below said upper yoke member in substantially parallel relationship therewith, one end of the core being connected to said upright yoke leg;

a generally L-shaped armature comprising a tab confronting the other end of the core and an actuator arm extending through said slot and having at its corner a transverse hinge axis by which the armature is hingedly supported onto the free end of the upper yoke member;

a relatively thin contactor plate made of electrically conductive material secured onto the upper yoke member and having a center spring blade extending integrally therefrom to overlie said actuator arm of the armature to bias it downwardly; and

a contact structure comprising a movable contact carried on the free end of said central blade and at least one fixed contact to be in engageable arrangement with the movable contact, said contact assembly located within the height of said yoke;

said center spring blade biasing the armature in the direction of releasing the tab away from the core, whereby in response to the coil being energized the armature hinges about said hinge axis against the biasing force of the center blade in one direction to press the center spring blade up for engaging the movable contact with the fixed contact and in response to the coil being deenergized the armature hinges in the opposite direction by that biasing force to disengage the movable contact from the fixed contact, and said actuator arm being received substantially within the depth of said slot in the upper yoke member during the hinging movement of the armature.

4,532,488

ELECTRIC MOTOR PROTECTION SWITCHES

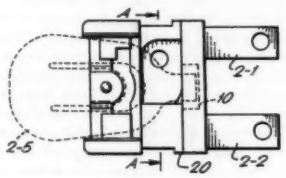
Arthur M. Blackburn, Buxton, England, assignor to Otter Controls Limited, Buxton, England

Filed Jan. 23, 1984, Ser. No. 573,092

Claims priority, application United Kingdom, Jan. 21, 1983, 8301624

Int. Cl.³ H01H *61/00, 71/16*

U.S. Cl. 337—111 **10 Claims**



1. An overload protection switch for an electric motor, comprising

(a) a snap-acting bimetallic switch-actuating element;

(b) a first terminal part mounting said bimetallic switch-actuating element;

(c) a moving contact carried by said bimetallic switch-actuating element;

(d) a fixed contact cooperating with said moving contact; and

(e) a second terminal part mounting said fixed contact;

(f) said first terminal, said bimetallic switch-actuating element, said moving and fixed contacts and said second terminal being electrically connected in series in said switch for carrying the electric load current of said motor when, in use of said switch, said switch is connected to said motor such that the electric load current of said motor flows through said switch; and

(g) at least one of said first and second terminal parts being in heat transfer relation with said bimetallic switch-actuating element and being formed of a material having a relatively high electrical resistance selected such that the respective part self-heats under load currents of said switch slowly relative to the self-heating of said bimetallic switch-actuating element, the arrangement being such that in response to a relatively high overload current level the self-heating of said bimetallic switch-actuating element predominates in determining a rapid operation of said switch, with the heating of said at least one part having a substantially negligible effect upon said switch operation, whereas in response to a current level barely of an overload level the self-heating of said at least one part and the transfer of heat therefrom to said bimetallic switch-actuating element contributes significantly to a relatively slow operation of said switch, whereby said switch is capable of carrying a relatively short-lived but normal full torque current of said motor without operating to open its contacts but will operate to open its contacts in due course in the event of a high load current being maintained for too long.

4,532,489

FUSES, PARTICULARLY SUBMINIATURE CARTRIDGE FUSES, AND A METHOD OF MANUFACTURE THEREOF

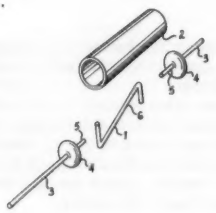
John P. Phillips, Bath, England, assignor to Dubilier PLC, Abingdon, England

Filed Apr. 5, 1984, Ser. No. 596,872

Claims priority, application United Kingdom, Apr. 8, 1983, 8309642

Int. Cl.³ H01H *85/14*

U.S. Cl. 337—228 **10 Claims**



6. A cartridge fuse link comprising a glass sleeve containing a fuse element connected at opposite ends to tail wires extending from respective ends of the sleeve which are hermetically sealed about the tail wires, in which the tail wires are fusion bonded to respective unitary annular collars which are fusion bonded to respective ends of the sleeve to form hermetic seals at the opposite ends, the fuse element being disposed entirely within the sleeve and entirely between the collars.

4,532,490

FAIL SAFE HIGH LIMIT CONTROL

Phillip M. Pappas, 12309 Hodges St., Houston, Tex. 77085

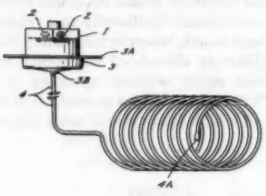
Filed May 23, 1983, Ser. No. 497,004

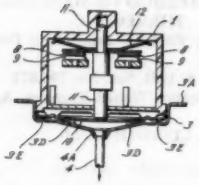
Int. Cl.³ H01H *37/38, 37/40*

U.S. Cl. 337—320 **3 Claims**

1. Fail safe temperature limiting control comprising a formed stainless steel cup, a formed stainless steel diaphragm welded to said cup bottom around its outer peripheral portion, a central cone formed outlet in cup bottom, upward extending dimples formed in cup bottom restricting downward travel of the diaphragm, cone formed capillary tube having an end mating with and welded to the central cone formed cup outlet with an open flexible capillary tube portion extending in coiled or straight manner for linear temperature sensing; as the open capillary tube end is attached to a vacuum pump and low vapor thermal fluid is introduced partially filling the capillary tube and lower sealed cup portion with sufficient vacuum

remaining to hold the sealing diaphragm down against the restricting dimples; the open capillary tube end is sealed by welding, a switch means secured to the cup with the switch contacts remaining in their normally closed or operating position, a central actuating rod end resting on the depressed diaphragm; with any leakage of the vacuum within the sealed capillary tube and cup bottom portion the diaphragm snaps upward raising the central actuating rod which raises a contact cross bar off of the stationary contacts within said swtich,





opening said contacts; the boiling of the thermal fluid anywhere along the capillary tube likewise reduces the vacuum causing the diaphragm to snap upward opening the swtich contacts; conversely when the fluid cools to a safe temperature the vapors condense restoring the vacuum thus pulling the diaphragm down against the restricting dimples closing the switch contacts as the central actuating rod drops down bringing the contact cross bar against the stationary contacts to provide automatic reset of the control.

4,532,491

LIQUID-LEVEL TRANSMITTER WITH BELL JAR HOUSING FOR GASOLINE TANKS

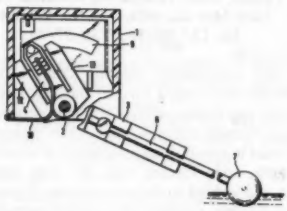
Karl Rau, Mühlheim, and Martin Haub, Steinbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,718

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146213

Int. Cl.[3] **H01L** *10/14;* **G01F** *23/10*

U.S. Cl. 338—33 **20 Claims**



1. In combination in a fuel tank a liquid-level transmitter comprising a pivotally supported lever which carries a float and is operatively connected to a contact of a wiper which is movable along an electrical resistor upon pivoting of the lever, the improvement comprising

a housing formed as a bell-shaped structural part having an opening located at the bottom and being sealed off at all other portions thereof,

the wiper and the electrical resistor being disposed in said bell-shaped structural part, and wherein

all portions of said resistor are supported within said housing at a sufficient distance above said opening so as to inhibit wetting of the resistor by the liquid during a raising of the fuel liquid level in the fuel tank, and wherein

said wiper is supported at a mounting on said housing, and extends from said mounting away from said opening for contacting said resistor.

4,532,492

TEMPERATURE-COMPENSATED, OXYGEN-CONTENT GAS SENSOR

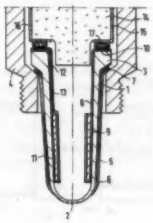
Friedrich J. Esper, Leonberg; Hermann Fischer, Stuttgart; Karl-Hermann Friese, and Peter Scharner, both of Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,717

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322534

Int. Cl.[3] **G01N** *27/12*

U.S. Cl. 338—34 **9 Claims**



1. Temperature-compensated oxygen-content gas sensor, to determine the oxygen content in gases, typically exhaust gases from an internal combustion engine (ICE), having

an oxygen-responsive sensor body (9) comprising a semiconductive metal oxide;

a thermistor body (1) located in thermally coupled relation to the oxygen-responsive sensor body (9) and comprising a material changing its resistance value with temperature;

and electrodes coupled to the oxygen-responsive sensor body (9) and to the thermistor body (1),

wherein, in accordance with the invention, the thermistor body (1) is a tubular structure having a cupped end;

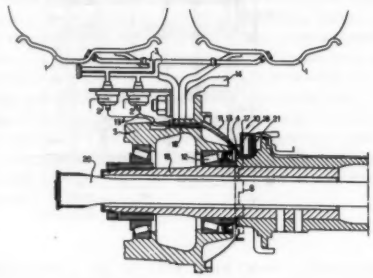
the material of the thermistor body (1) comprises a densely sintered resistance material and forms a substrate and support for the sensor body (9);

and wherein the sensor body (9) comprises a porous resistance material and is applied against a surface of the thermistor body (1), with an electrode (8), which is in the form of a layer, interposed between the thermistor body (1) and the sensor body (9).

4,532,493
DEVICE FOR DETECTING UNDERINFLATION OF A TIRE AND FOR MEASURING THE KINETIC STATE OF A VEHICLE WHEEL AND THE VEHICLE

Jean-Paul Sibeud, Saint Symphorien d'Ozon, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed Jan. 20, 1984, Ser. No. 572,243
Claims priority, application France, Jan. 20, 1983, 83 00867
Int. Cl.³ B60C *23/02;* **G01L** *9/14*
U.S. Cl. 340—58 **6 Claims**



1. A device for detecting the underinflaion of the tire of a motor vehicle wheel and for measuring the kinetic state of the wheel and of the vehicle from the kinetic state of several wheels, comprising:

electromagnetic sensor means fixed to said vehicle;

circuit means fixed to said wheel and rotating with said wheel wherein said circuit means periodically passes in front of said sensor means during rotation of said vehicle wheel;

a toothed wheel which rotates with said vehicle wheel and which contains a plurality of teeth with at least one of said teeth being constructed so that the electro-mechanical characteristics of said at least one tooth is modified by pressure drop in one of said tires of said motor vehicle wheels, wherein said toothed wheel generates a signal formed of successive pulses whose period is modified by the variation and the electrical characteristics caused by the pressure drop in one of said tires and by the speed and acceleration conditions of the rotation of said wheel and wherein said electromagnetic sensor detects said tooth wheel generated signal; and

means for computing the values of successive periods of said pulses and for computing the relative variation of said values from several periods wherein said means for computing outputs a signal indicating one of an acceleration, a deceleration and the state of underinflation of one of said tires according to said variation of said value from several periods.

4,532,494
ADAPTIVE DELTA CODEC WHICH VARIES A DELTA SIGNAL IN ACCORDANCE WITH A CHARACTERISTIC OF AN INPUT ANALOG SIGNAL

Itsuo Sasaki, Kawasaki; Hiroaki Suzuki, Yokohama, and Masakazu Kamichika, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 30, 1981, Ser. No. 335,652
Claims priority, application Japan, Jan. 9, 1981, 56-1985; Jan. 9, 1981, 56-1986; Jan. 19, 1981, 56-6174
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **2 Claims**

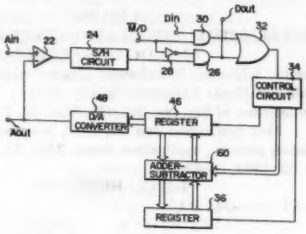
1. An adaptive delta codec comprising:

delta coding means which compares the level of an analog input signal and an estimated signal, and generates a coded signal in response to the result of the comparison;

first and second control terminals which receive control signals indicative of the increase or decrease in a delta signal and the estimated signal;

first and second storing means for respectively storing the delta signal and the estimated signal;

adder/subtractor means connected to said first and second storing means in time-division manner, and which decreases an absolute value of the estimated signal in the second storing means during a first time period, changes

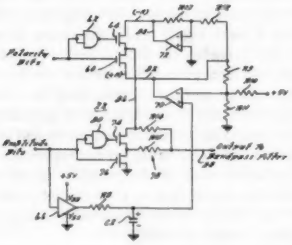


the delta signal in said first storing means in accordance with the level at said first control terminal during a second time period, and makes an addition or subtraction of the delta signal and the estimated signal in accordance with the level at said second control terminal during a third period, the result of the addition or subtraction in the third period being stored in the second storing means as a new estimated signal.

4,532,495
SPEECH DIGITIZATION SYSTEM

Richard T. Gagnon, Rochester, Mich., assignor to Votrax, Inc., Troy, Mich.

Continuation of Ser. No. 73,119, Sep. 6, 1979, abandoned, which is a division of Ser. No. 880,996, Feb. 24, 1978, abandoned. This application Jan. 7, 1982, Ser. No. 337,626
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **11 Claims**



1. A de-digitizer for use in a companded speech digitization system including a digitizer circuit for generating a digital approximation of a bipolar analog audio input signal, the de-digitizer reconstructing the analog input signal from a pulse code modulated digital input signal representing a digital approximation of said analog waveform, including:

generator means responsive to said digital input signal for generating an amplitude function signal in accordance with said digital input signal, including first means for converting said digital input signal to a corresponding first analog signal, a bias network for producing a predetermined offset signal and an amplifier having associated therewith a predetermined gain greater than one and less than or equal to five and having said first analog signal

connected to its positive input and said predetermined offset signal connected to its negative input;

decoder means for generating the analog input signal by multiplying said digital input signal with said amplitude function signal.

4,532,496

PULSE WIDTH MODULATION TYPE DIGITAL TO ANALOG CONVERTER

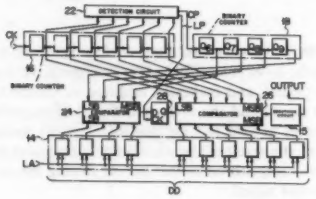
Kazuaki Ichinose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 361,071, Mar. 23, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,747

Claims priority, application Japan, Mar. 23, 1981, 56-40494; Mar. 23, 1981, 56-40495

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **4 Claims**



1. A DA converter comprising:

storing means for temporarily storing N-bit digital data to be DA converted;

digital value string generating means for counting pulses of a predetermined frequency to sequentially binary numbers, said generating means comprising an n-bit ($n<N+1$) binary counter;

a detection circuit which is connected to said n-bit binary counter, for detecting when a count of said n-bit binary counter has reached first and second preset numbers and outputtting a clock signal when the count of said n-bit binary counter reaches the first preset number and outputting a latch signal when the count of said n-bit binary counter reaches the second preset number;

an $(N-n)$ binary counter which is connected to said detection circuit and for incrementing its count thereof upon receipt of said clock signal from said detection circuit;

N-bit comparing means connected to said storing means and said digital value string generating means, for sequentially comparing each of the plurality of digital value strings with the digital data so as to output pulses corresponding to the number of the digital value strings, said N-bit comparing means including:

a first comparator for comparing the count from said N-bit counter, in an inverted order, with the lower significant n-bits of the N-bit data to be converted,

a latch circuit which is connected to the outputs of said first comparator and said detection circuit or latching an output from said first comparator in response to the latch signal from said detection circuit, and

a second comparator which is connected to the output of said latch circuit, for comparing the contents of the n-bit counter with the higher significant n-bits of the N-bit data to be converted and for producing a comparison output signal with a control priority over an output from said latch circuit; and

smoothing means, connected to said N-bit comparing means, for converting the output of said N-bit comparing means into an analog signal representing said N-bit digital clock.

4,532,497

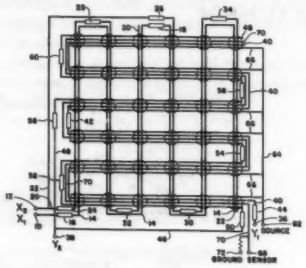
MATRIX KEYBOARD WITH PLURALITY OF SEQUENCES OF CASCADED ELECTRICAL ELEMENTS

Sherif Danish, Tulsa, Okla., assignor to Polytel Corp., Sunnyvale, Calif.

Filed Jan. 14, 1983, Ser. No. 458,018

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 S **7 Claims**



1. In a multikey keyboard for inputting data to a computer wherein the X and Y rank of the pressed key is determined by the closing of a corresponding key switch means that brings into the X and Y keyboard output circuit selected portions of a pair of separate series of electrical elements which respective cumulative values are subsequently measured by the computer to uniquely establish the coordinates of the pressed key, the specific improvement comprising: replacing at least one of said X or Y keyboard output circuits with a plurality of keyboard output circuits wherein each of said plurality of keyboard output circuits comprise a keyboard output terminal electrically connected to separate sequences of cascaded electrical elements and associated conductors such that pressing of a key introduces into said respective plurality of keyboard output circuits a corresponding portion of each of said separate sequences of electrical elements that in combination uniquely define the rank of the key being pressed.

4,532,498

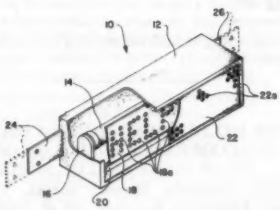
BURGLAR ALARM DEVICE

George T. Gilmore, 3113 Arrowood Dr., Raleigh, N.C. 27604

Filed Oct. 11, 1983, Ser. No. 540,317

Int. Cl.³ G08B *13/08*

U.S. Cl. 340—545 **7 Claims**



1. A burglar alarm system for indicating that a building is being subject to an unauthorized entry, comprising: a sign type signaling device adapted to be disposed in a conspicuous location about a building and including a housing structure having light means disposed therein, said housing structure including an outer continuously exposed stationary face plate with a plurality of perforations formed therein about a substantial area thereof, and a stationary message plate disposed within said housing between said light means and said face plate with said

message plate including a plurality of perforations formed therein in a pattern that effectively spells out a constant stationary distress message, and wherein the perforations in the outer face camouflage the message plate when said light means is not actuated but wherein the perforations in said outer face plate and said message plate are so arranged to always register such that light may project through aligned openings of both said outer face plate and said message plate when said light means is actuated such that the distress message appears across said outer face plate; entry sensing means operatively associated with entry areas of said building such as doors and windows, said entry sensing means including switching means operatively mounted adjacent windows and doors and adapted to be actuated by the opening of such; circuit means operatively interconnecting said sign type signaling device with said entry sensing means such that the actuation of said switching means by the movement of a door or window results in the circuit being closed; and power supply means operatively connected in said circuit for supplying power to said sign type signaling device so as to actuate the same upon the actuation of said entry sensing means.

4,532,499

MEANS FOR DETECTING THE CONTACT WEAR OF ELECTRICAL SWITCHING DEVICES

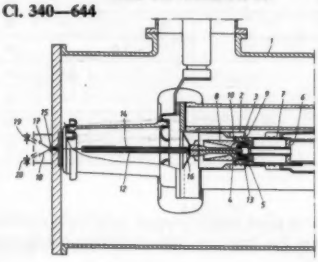
Thorbjörn Collin, Västerås; Börje Erikmats, Ludvika; Svante Forsberg, Ludvika; Harry Göransson, Ludvika; Lars Sander, Västerås, and Carl E. Sölver, Ludvika, all of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

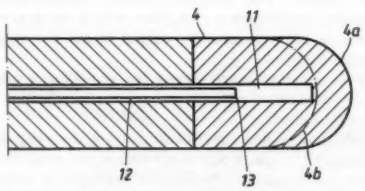
Filed Sep. 26, 1983, Ser. No. 535,781

Claims priority, application Sweden, Oct. 25, 1982, 8206040

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—644 **5 Claims**





1. Means for detecting contact wear in an electrical device which includes at least one pair of current-interrupting contacts (4, 5), characterized in that in one (4) of the contacts of said contact pair (4, 5) there is provided, behind the wear surface of the contact, an aperture (11) which passes through the contact (4) at, or has its bottom located at, the level which corresponds to a worn out contact, and that a light conductor (12) comprising at least one optical fiber is arranged in said aperture (11), which light conductor serves as a connecting link for transmission of a signal from the contact (4) to a detector (20) when the wear has reached said level.

4,532,500

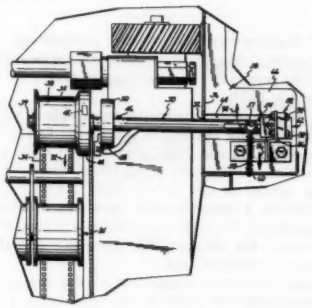
WEB TENSION AND BREAK SENSOR SYSTEM FOR PHOTOSENSITIVE WEB PROCESSORS

Keith L. Henk, Brooklyn Park, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sep. 2, 1982, Ser. No. 414,426

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—675 **2 Claims**



1. An apparatus for sensing both web movement and web tension of a photosensitive web moving through a photographic processor, the apparatus sensing both web movement and web tension through a singular contact with the photosensitive web, the processor having a frame structure, the apparatus comprising:

a longitudinal sensing arm pivotally attached to the processor about a pivot point and having a first end and a second end;

a single roller for engaging the photosensitive web and rotatably attached to the first end of the sensing arm such that movement of the web rotates the roller, the roller including a magnet positioned within the roller such that the magnet rotates with the roller;

a first stationary magnetically actuated switch disposed on the sensing arm such that the first stationary magnetically actuated switch is actuated by the magnet each time the magnet passes the switch due to contact of the film with the single roller;

alarm control means for measuring the time between actuations of the first switch and comparing the time to a predetermined value such that when the time between said first switch actuations is greater than the predetermined value an alarm is actuated;

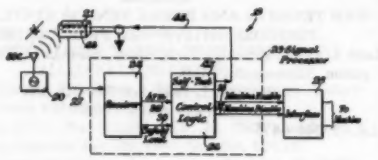
a coil spring attached at one end to the second end of the sensing arm on a side of the pivot point opposite from the roller and at another end to a stationary part of the photographic processor, biasing the arm against a tension force caused by the film contacting the roller; and

a second stationary switch positioned proximate the second end of the sensing arm such that the second switch is actuated by movement of the sensing arm due to contact of the film with the single roller when the tension force caused by the film becomes greater than the biasing force of the spring such that both web movement and web tension are detected by contact of the film with the single roller.

4,532,501
CAPACITIVELY COUPLED MACHINE TOOL SAFETY SYSTEM

Gary R. Hoffman, Glen Arm, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1982, Ser. No. 345,193
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—679 21 Claims



1. A machine tool safety system comprising:

an electric field generator adapted to be carried on a portion of the person of a machine tool operator for generating an electric field;

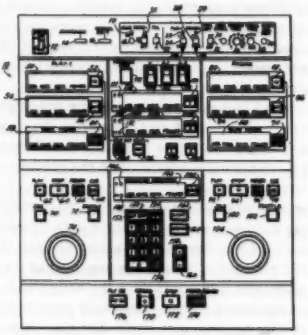
a capacitive receptor antenna mountable in a predetermined location with respect to a machine tool and cooperable with the electric field generator to form a capacitively coupled transmission arrangement operative to induce, by the action of the electric field through the capacitive coupling, a monotonically increasing electrical signal the magnitude of which is functionally related to the distance between the electric field generator and the capacitive receptor antenna; and

a signal processor connected to the capacitive receptor antenna and responsive to the signal induced in the capacitive receptor antenna by the electric field to generate an indication when the magnitude of the induced electrical signal exceeds a indication predetermined threshold, the first indicator being able to be used to permit safe operation of a machine tool.

4,532,502
APPARATUS FOR SELECTIVELY TRANSFERRING DATA BETWEEN REGISTERS

William A. Menezes, Mountain View, and Douglas D. Kuper, Campbell, both of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,444
Int. Cl.[3] G09F 9/32; G06F 1/00; H04N 5/22
U.S. Cl. 340—717 19 Claims

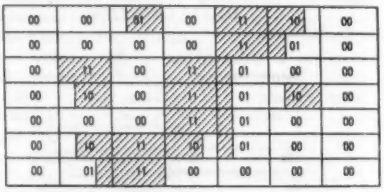


1. A system for selectively transferring data displayed at one of a plurality of display means to another of said plurality of display means, comprising a plurality of display means for displaying data; a plurality of storage means for storing data which is displayed at corresponding ones of said display means; a plurality of manually operable selector switches associated with respective ones of said storage means and adjacent to respective ones of said display means, each operable to designate its associated storage means in which is stored the data displayed at said respective display means as a source storage means from which said data stored therein is transferred and selected ones of the remaining selector switches being operable to designate their associated storage means as destination storage means; control means responsive to the operation of a first of said selector switches to cause an associated storage means to be designated as a source storage means, said control means being responsive to the operation of a second of said selector switches to designate the storage means associated therewith as a destination storage means and to supply thereto the data then stored in the source storage means, whereby the data stored in said destination storage means is displayed at the display means corresponding thereto; and indicator means associated with respective ones of said manually operable selector switches and responsive to the designation of an associated storage means as a source storage means to provide a distinctive indication thereof.

4,532,503
SEQUENCE CONTROLLED PIXEL CONFIGURATION

William B. Pennebaker, Carmel, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,114
Int. Cl.[3] G09G 1/16
U.S. Cl. 340—728 7 Claims



1. A plural tone pixel display system exhibiting minimized optical aberration as a result of tone-producing configuration within each pixel

plural-bit-per pixel input means providing value signals defining a picture as a sequence of multi-unit plural-tone pixels, including a "present" pixel, which present pixel has a "neighbor" pixel spatially related in the picture, which present pixel in turn is a neighbor pixel to the next present pixel in the sequence the output means for supplying image signals;

neighbor pixel sequence means, for providing a neighbor pixel value signal indicative of a tone characteristic of the neighbor pixel;

sequence controlled pixel configuration decoding means, connected to said input means and to said neighbor pixel sequence means, to provide pixel configuring output signals to said output means as a composite function of neighbor pixel value signals from said neighbor pixel sequence means and of present pixel value signals from said input means; and

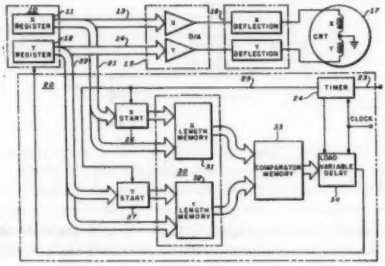
present pixel means, connecting said input means to said neighbor pixel sequence means, for setting said neighbor pixel sequence means to a value which is a function of the value of the present pixel,

whereby the output means is provided, for a representative pixel output, signals defining a present pixel configuration which is a function of the composite bit value of the neighbor pixel and also of the present pixel.

4,532,504
SLEW LENGTH TIMER

Paul A. Fisher, Mesa, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,397
Int. Cl.³ G09G 1/08
U.S. Cl. 340—739 **9 Claims**



1. An apparatus for utilization with a symbol generator for a display having a coordinate system with orthogonal first and second display axes comprising:

means coupled to receive signals from said symbol generator signifying first and second display axes start and end positions for providing signals representative of slewing time intervals between said start and end positions for each of said first and second display axes;

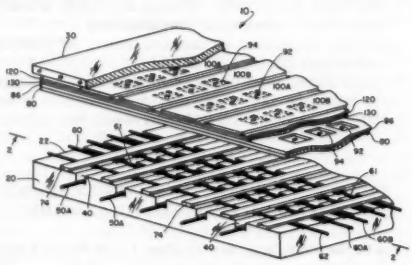
comparator means coupled to receive said first and second display axis slewing time representative signals for providing a coded signal representative of a slew time interval for said start and end positions by selecting one of said first and second display axis slewing time intervals of longer duration and providing a signal representative of said selected one coordinate slew time interval; and

means responsive to said signal representative of said slew time interval for providing an end of slew signal to said symbol generator.

4,532,505
GAS-FILLED DOT MATRIX DISPLAY PANEL

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1982, Ser. No. 451,843
Int. Cl.³ G09G 3/28
U.S. Cl. 340—775 **16 Claims**



1. A display panel comprising

a matrix of first gas-filled cells arrayed in rows and columns,

an anode electrode and a cathode electrode associated with said first cells,

each of said cathode electrodes including a series of operating cathode portions, each portion being associated with one of said first cells,

circuit means coupled to said anode and cathode electrodes for turning on said first cells in successive groups in a scanning cycle, the turn-on of said cells generating cathode glow,

a matrix of display cells arrayed in rows and columns,

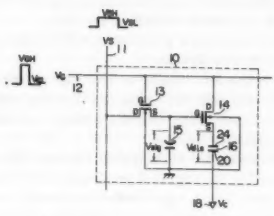
each first cell and each operating portion of each cathode thereof being in operative relation with more than one display cell, and

a plurality of sustainer electrodes, there being one sustainer electrode for each of the display cells which is in operative relation with each cathode portion, so that, when a cathode portion is energized and exhibiting cathode glow, one of the display cells in operative relation therewith is selected and caused to glow by energization of its sustainer electrode.

4,532,506
MATRIX DISPLAY AND DRIVING METHOD THEREFOR

Masaaki Kitazima, Hitachiota, and Hideaki Kawakami, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,585
Claims priority, application Japan, Oct. 30, 1981, 56-172733
Int. Cl.³ G09G 3/30
U.S. Cl. 340—784 **16 Claims**



1. A matrix display comprising:

a plurality of picture cells generally arranged in a matrix, said picture cells being defined by a plurality of first electrodes arranged on a first substrate and at least one common electrode arranged on a second substrate and a display medium held therebetween;

a plurality of first signal lines and a plurality of second signal lines crossing said first signal lines, arranged on at least one of said first and second substrates;

a plurality of first semiconductor switches each having a control terminal, a first main terminal and a second main terminal, a plurality of second semiconductor switches each having a control terminal, a first main terminal and a second main terminal, and a plurality of storage means, arranged at respective crosspoints of said first signal lines and said second signal lines;

each of said first signal lines being connected to said control terminal of the associated one of said first semiconductor switches and said first main terminal of the associated one of said second semiconductor switches;

each of said second signal lines being connected to said first main terminal of the associated one of said first semiconductor switches;

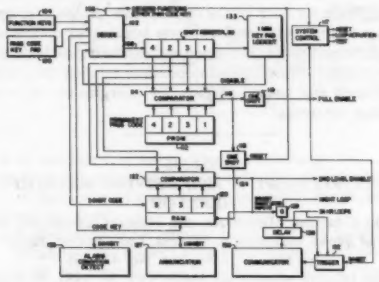
each of said second main terminals of said first semiconductor switches being connected to the associated one of said storage means and said control terminal of the associated one of said second semiconductor switches; and

each of said second main terminals of said second semiconductor switches being connected to the associated one of said first electrodes.

4,532,507
SECURITY SYSTEM WITH MULTIPLE LEVELS OF ACCESS

James B. Edson, Concord, Mass., and Patrick G. Monroe, Ridgewood, N.J., assignors to American District Telegraph Company, New York, N.Y.

Continuation of Ser. No. 295,621, Aug. 25, 1981, abandoned.
This application Nov. 4, 1983, Ser. No. 549,632
Int. Cl.[3] H04Q 9/00; G08B 19/00
U.S. Cl. 340—825.31 22 Claims



1. A multiple priority security system providing multiple levels of personnel access to multiple prioritized security controllers of a secured facility, comprising:

means for storing a predetermined top priority code;

a first memory device;

input means for writing a first top priority system access code into said first memory device, and for writing a second and lower priority system access code into said first memory device;

means, connected to said first memory device and to said means for storing said predetermined top priority code, for providing a signal whenever said predetermined top priority code matches said first top priority system access code in said first memory device;

means, connected to said input means and enabled in response to said signal, for controlling substantially all of said prioritized security controllers via said input means;

a second memory device, coupled to said input means and to said first memory device and enabled by said signal, for storing a predetermined second and lower priority code therein via said input means; and

means connected to said second memory device and to said first memory device and operative in response to a match between said predetermined second and lower priority code and said second and lower priority system access code for enabling access to preselected lower priority ones of said prioritized security controllers.

4,532,508
PERSONAL AUTHENTICATION SYSTEM

Hartwig Ruell, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Apr. 1, 1983, Ser. No. 481,198
Int. Cl.[3] H04Q 9/00; G06K 9/00, 9/74
U.S. Cl. 340—825.34 4 Claims

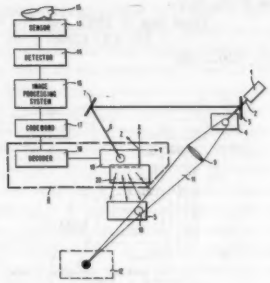
1. The method of storing scrambled information on a portable storage medium using a coherent light beam for personal identification purposes, which comprises the steps of:

(a) sensing the personal features of a person;

(b) deriving at least one information signal indicative of said sensed personal features;

(c) developing a distinct scramble key directly from the sensed personal features indicated by said information signal;

(d) using said scramble key to encode the coherent light beam to produce a modulated reference light beam; and

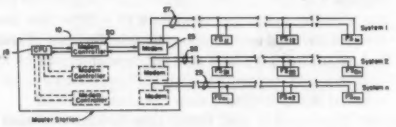


(e) storing a holographic image on said portable storage medium using said modulated reference light beam.

4,532,509
COMMUNICATION SYSTEM HAVING TIMER CONTROLLED FIELD STATIONS

John T. Pulverenti, Gates; Robert S. Hentz, Fairport, and John J. DiPaola, Penfield, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,901
Int. Cl.[3] H04Q 9/00
U.S. Cl. 340—825 12 Claims



1. A communication apparatus for communicating between a central office and a plurality of separately addressable remote stations over a single duplex communication link, said apparatus including a transmitter and receiver at said central office and at each of said remote stations, digital computer means for controlling said central office transmitter and responsive to said receiver, said digital computer means including;

a plurality of first timers, each associated with a different remote station,

means to set each said first timer to a value related to the maximum desired delay between successive communications with the associated remote station,

means for monitoring all said first timers for determining that a timer has expired, and

transmit control means responsive to said monitoring means for operating said transmitter to transmit to a remote station associated with said timer which has expired.

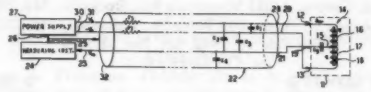
4,532,510
MEASURING APPARATUS HAVING A SENSOR LOCATED REMOTELY FROM ITS ELECTRICITY POWER SUPPLY

Pierre C. Bertrand, Igny, and Thijlbert C. De Paepe, Palaiseau, both of France, assignors to Sereg, S.A., Montrouge, France

Filed Jun. 24, 1982, Ser. No. 391,765
Int. Cl.[3] G08C 19/00, 25/02, 19/04
U.S. Cl. 340—870.39 7 Claims

1. Apparatus for measuring a physical characteristic comprising a sensor having a first electrical characteristic which is directly modifiable by and representative of the physical characteristic to be measured, an electrical link comprising two

conductors connecting said sensor to a remote electrical power supply and a third conductor connecting the sensor with means for measuring the electrical characteristic which is representative of the measured physical characteristic, the link having a second electrical characteristic capable of disturbing the measurement made by the sensor, wherein the apparatus



further comprises secondary measuring means located proximate the power supply responsive at any given moment to a measured value of the second electrical characteristic of the link plus sensor assembly for controlling the power supply as a function of said measured value in order to eliminate the disturbance that would otherwise result therefrom.

4,532,511

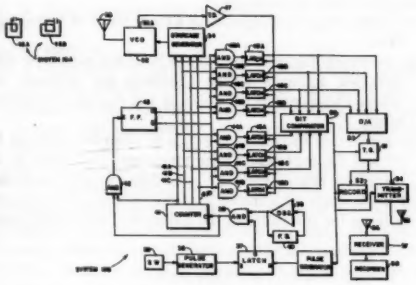
AUTOMATIC VEHICLE IDENTIFICATION SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 84,429, Oct. 12, 1979, Pat. No. 4,288,689. This application Sep. 2, 1981, Ser. No. 298,743

Int. Cl.[3] **G08G** *1/01;* **G06K** *7/00;* **G08B** *13/14*

U.S. Cl. 340—933 **8 Claims**



1. A method of tracking objects comprising:

generating an energy field at a fixed location in a tracking area, which energy field is composed of a number of discrete and fixed radio frequency signals of different frequencies,

disposing different coded arrays of passive tuned electrical circuits on a plurality of objects to be tracked which objects may pass said known location, and wherein each of said coded arrays of circuits defines a code which is different from the codes defined by the other objects so that each object has an array of such circuits which is different from the arrays of circuits defining the codes of the other objects, and

when an object with a coded array of tuned electrical circuits comes within a given range of said fixed location in said tracking area, indicating the presence of said object thereat by detecting the presence of its tuned electrical circuits by sensing the absorption of energy of said field by said passively tuned circuits and generating a corresponding electrical signal for each frequency of the field which experiences energy absorption, and

generating a code signal defined by the combination of said tuned electrical circuits detected when said object is within said given range of said field and employing said code signal to indicate the presence of said object at said known location.

4,532,512

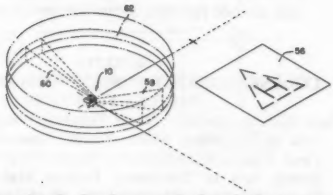
OMNIDIRECTIONAL APPROACH SLOPE INDICATOR SYSTEM

Jesse H. Tanner, 261 Taylor Ave., Northwest, Renton, Wash. 98055

Filed Nov. 22, 1982, Ser. No. 443,289

Int. Cl.[3] **G08G** *5/00;* **B64F** *1/20*

U.S. Cl. 340—950 **7 Claims**



1. An omnidirectional, visual approach slope indicator comprising:

a first light-generating unit including means for generating a first beam of a light of a first color in one direction and a second light-generating unit including means for generating a second beam of light of a second color in an opposite direction, the units including beam directing means to cause the lower edge of the light beam of the second unit to overlap the upper edge of the light beam of the first unit along a predetermined angle for the glide slope,

a frame for supporting the units on a surface, and

means for rotatably mounting the units on the frame for rotation up to 360°.

4,532,513

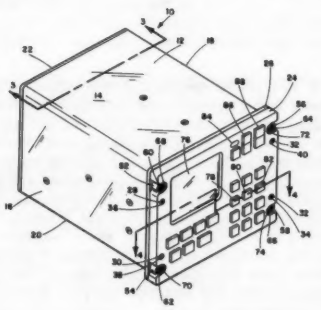
AIRCRAFT NAVIGATION COMPUTER DISPLAY

Sheldon J. Halvorson, Prescott Valley, Ariz., assignor to Global Navigation, Inc., Irvine, Calif.

Filed Aug. 27, 1981, Ser. No. 296,699

Int. Cl.[3] **G01C** *21/00;* **H05K** *1/14;* **H04N** *5/72, 5/64*

U.S. Cl. 340—971 **14 Claims**



1. A navigation computer display assembly for aircraft comprising:

a housing configured with a rectangular cross-section and having a first and a second side along with a top and a bottom;

a cathode ray tube assembly, including a cathode ray tube having a display screen, located and secured in an upper quadrant of said housing;

a power supply located and secured in a lower quadrant of said housing below said cathode ray tube assembly;

a plurality of circuit boards vertically orientated and slidably secured within said housing and located on the side opposite to said cathode ray tube and said power supply;

a rear panel, including a receptical assembly for receiving said circuit boards, secured to said housing;

a front panel assembly including a plurality of switches and configured with a CRT aperture, removably secured to said housing with said aperture aligned with said cathode ray tube, thereby permitting said circuit boards to be removed from the front of said housing; and

a shield configured out of high permeability metal enclosing said cathode ray tube and secured to said top of said housing and to said side of said housing effective to secure said cathode ray tube within said housing.

4,532,514

COURSE GUIDANCE SYSTEM WITH SPEEDED-UP DISPLAY FUNCTION

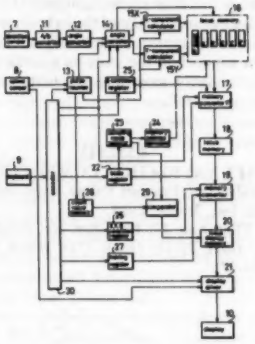
Itaru Hatano, Morioka; Kenji Takahashi; Shigeru Hirosawa, both of Takizawa; Mikio Kanda, Tamayama; Shinichiro Yasui, Tokyo; Akira Ichikawa, Wakoh; Teruo Mimori; Toshio Sasaki, both of Yokohama; Tadashi Mukai, Tokyo, and Thuneo Takahashi, Thurugashima, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 13, 1982, Ser. No. 407,999

Claims priority, application Japan, Aug. 14, 1981, 56-127398

Int. Cl.³ G08G 1/12

U.S. Cl. 340—995 **6 Claims**



1. In a course guidance system which includes a direction sensor and a speed sensor both fitted to a moving body, a display mounted in said moving body and a map displayed on the display surface of said display and in which the existing position of said moving body is derived by said direction sensor in cooperation with said speed sensor and is plotted on said display in such a manner as to correspond to said map, the improvement comprising: a locus memory for sequentially storing an X component value and a Y component value of the driving position based a predetermined driving distance obtained from said speed sensor and on the driving position obtained from said direction sensor; a locus display memory for storing data in such a manner as to correspond to the display surface of said display, said data being obtained by reading the content of said locus memory in a manner responsive to the scale of reduction of said map; and a display for plotting the driving locus of said moving body on the display surface based on the contents of said locus display memory; wherein the data to be read when the contents of said locus memory is transferred to said locus display memory are divided into a plurality of groups each consisting of a data line to be read at a predetermined interval and are sequentially read and transferred to the display, and the plotted line of the driving locus is displayed sequentially and progressively from a rough display to a dense display.

4,532,515

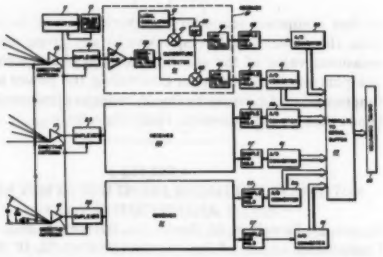
ANGLE OF ARRIVAL MEASUREMENTS FOR TWO UNRESOLVED SOURCES

Ben H. Cantrell, 7009 Catlett St., Springfield, Va. 22151; William B. Gordon, 14013 Monorvale Rd., Rockville, Md. 20853, and Gerard V. Trunk, 503 Tolna St., Baltimore, Md. 21224

Filed Feb. 10, 1982, Ser. No. 347,676

Int. Cl.³ G01S 13/00

U.S. Cl. 343—16 R **3 Claims**



1. A method of estimating the angles of arrival $\theta 1$ and $\theta 2$ of two closely spaced radar targets of which one target may be the virtual image of the other target, and tracking those targets, comprising the steps of:

(a) illuminating the targets with a radar beam of wavelength WL;

(b) receiving the resulting echoes from the targets at three directive antennas whose apertures are coplanar and whose phase centers are colinear and spaced a distance D apart;

(c) converting the received echos to complex numbers S1, S2 and S3, representing the magnitude and phase of the respective echos received by the three directive antennas;

(d) if the plane of symmetry of the two targets is known, solving for the value of the parameter WD which minimizes

$$L=|S1-WB(WD+WD^*)S2+WB^2S3|^2$$

where

$$WB=exp(j2\pi D\theta B/WL)$$

and θB is the known angle bisecting the angles of arrival of the two targets; and

(e) calculating the angles of arrival $\theta 1$ and $\theta 2$ from

$$\theta 1=(WL/2\pi D)\tan^{-1}[Im(WD\cdot WB)/Re(WD\cdot WB)],$$

and

$$\theta 2+(WL/2\pi D)\tan^{-1}[Im(WD^*\cdot WB)/Re(WD^*\cdot WB)];$$

(f) if the plane of symmetry of the two targets is not known, solving for the values of the parameters WD and WB which minimize

$$L=|S1-WB(WD+WD^*)S2+WB^2S3|^2;$$

(g) calculating the angles of arrival $\theta 1$ and $\theta 2$ from

$$\theta 1=(WL/2\pi D)\tan^{-1}[Im(WD\cdot WB)/Re(WD\cdot WB)],$$

$$\theta 2=(WL/2\pi D)\tan^{-1}[Im(WD^*\cdot WB)/Re(WD^*\cdot WB)];$$

and,

(h) tracking said two closely spaced radar targets in accor-

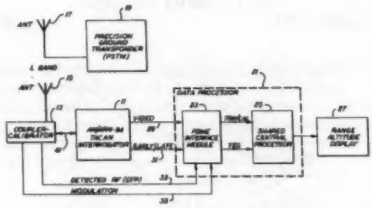
dance with the angles of arrival $\theta 1$ and $\theta 2$ for said respective targets.

4,532,516

CALIBRATOR FOR DISTANCE MEASURING EQUIPMENT

Victor A. Frampton, Fishkill; James R. Drake, Yorktown Heights, both of N.Y., and William R. Slump, Glen Rock, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 18, 1982, Ser. No. 435,054
Int. Cl.³ G01S *7/40*
U.S. Cl. 343—17.7 **3 Claims**



1. In distance measuring equipment apparatus which includes:

(a) an antenna;

(b) a transmitter/receiver coupled to said antenna to transmit interrogation pulses and receive responses from a ground station, the pulses being spaced apart, the ground stations also transmitting other responses between said responses; and

(c) a data processor receiving video and gate signals from said transmitter/receiver and calculating therefrom the distance to the ground station, a method of calibrating for recovery and installation delays comprising: modulating, at a position close to the antenna, the received signal other than when one of said responses is being received and detecting the phase of the resulting modulation on the video signal with respect to the phase of modulation at the modulator to determine the receiver and installation delay; and

wherein said step of modulating comprises dividing a square wave to obtain a wave at the desired modulation frequency; filtering said square wave at the desired modulation frequency; filtering said square wave to obtain a sine wave; applying said sine wave to the received signal in a modulator; blocking modulation in response to a range gate signal developed in said transmitter receiver during the time for receiving response pulses; and utilizing said square wave to detect the phase of said video signal; and

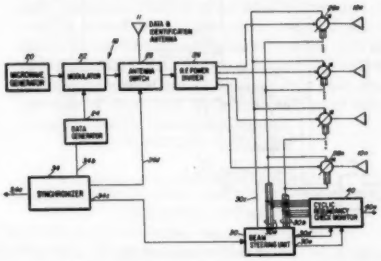
wherein said method includes coupling said square wave through a voltage controlled delay; developing a pair of square wave signals which are 180 degrees out of phase from said delayed square wave; developing from the video signal, two video signals which are 180 degrees out of phase; and switching said two video signals to an integrator under control of said pair of square wave signals; integrating said video signals; and utilizing the integrated result as a control signal for said voltage control delay, said delay thereby being representative of the phase difference, and further including developing a pulse having a width proportional to said delay from the output of said voltage controlled delay and said square wave.

4,532,517

CYCLIC REDUNDANCY CHECK MONITOR FOR MICROWAVE LANDING SYSTEM BEAM STEERING UNIT

Edward F. C. LaBerge, and Robert K. Calzetta, both of Baltimore, Md., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 28, 1983, Ser. No. 470,352
Int. Cl.³ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 343—372 **4 Claims**



1. A cyclic redundancy check monitor for monitoring the accuracy of a train of command digital words applied to scanning antenna means in a microwave landing system to produce scanning motion of the beam of said antenna, comprising,

means for storing a first polynomial;

means receiving the command digital word currently applied to said antenna means and said first polynomial for providing the modulo 2 sum of said current command word and said first polynomial;

means for increasing the degree of each tenm of said second polynomial;

means for dividing said increased degree second polynomial by a predetermined generator polynomial whenever the highest degree term of said increased degree second polynomial is of the same degree as the highest degree tenm of said generator polynomial, said division producing a remainder polynomial;

means for storing said remainder polynomial for use as said first polynomial upon the appearance of the command word next to follow said current command word;

means for storing a predetermined check word;

means for determining said remainder polynomial for each of a succession of N said command words;

means for comparing said first polynomial stored after the appearance of the Nth said command word with said check word; and

means for signaling non-agreement between said compared first polynomial and said check word.

4,532,518

METHOD AND APPARATUS FOR ACCURATELY SETTING PHASE SHIFTERS TO COMMANDED VALUES

Stanley Gaglione, New Hyde Park, and John J. Stangel, Mahopac, both of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,504
Int. Cl.³ H04B *7/08;* **H01Q** *3/36*
U.S. Cl. 343—372 **6 Claims**

1. A method of shifting the phase of an input signal through a predetermined phase angle which comprises:

coupling a signal representative of said input signal and a signal representative of said input signal after a phase shift has been applied thereto to a phase detector for establishing signals representative of phase differences therebetween;

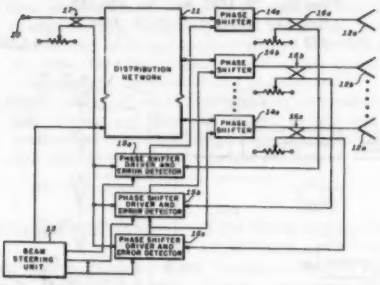
coupling said phase difference representative signals to a processor for processing;

selecting desired calibration data from a memory unit;

applying said selected calibration data to said processor; and

utilizing said selected calibration data in processing said phase difference representative signals to establish phase comparator signals;

providing phase shift command signals to said shifter means corresponding to desired phase shifts for said input signal;



comparing said phase shift command signals with said phase comparator signals to establish phase control error signals;

combining said phase control error signals with said phase shift command signals to establish said phase control signals; and

coupling said control signals to said phase control terminals of said variable phase shifter.

4,532,519

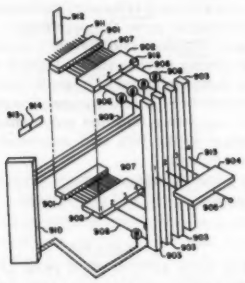
PHASED ARRAY SYSTEM TO PRODUCE, STEER AND STABILIZE NON-CIRCULARLY-SYMMETRIC BEAMS

Ronald M. Rudish, 50 Bethany Dr., Commack, N.Y. 11725, and Peter J. McVeigh, 10 Thomas Dr., Hauppauge, N.Y. 11787

Filed Oct. 14, 1981, Ser. No. 311,464

Int. Cl.³ H01Q *3/22, 3/24, 3/26*

U.S. Cl. 343—372 **8 Claims**



1. Apparatus for eliminating antenna induced errors in systems utilizing fan beams, including correction of fan beam distortions in a phased array antenna caused by electronic scanning of the beam or by movement, such as roll, of the structure upon which the antenna is mounted, comprising:

(a) a phased array antenna comprising orthogonal rows and columns of antenna elements,

(b) means for forming fan beam constituents, each having a generally elliptical cross section at its 3 dB level with the cross section having a longitudinal axis positioned generally in the azimuthal plane for reference purposes, and the cross sections having ends generally oriented orthogonal to the longitudinal axis,

(c) means for aligning the fan beam constituents generally end to opposite end along a line with their longitudinal axis generally parallel to one another, their opposite ends adjacent one another and their centers along the line to form a single composite fan beam, the line constituting the longitudinal axis of the composite beam, the means for positioning the fan beam constituents including means for individually adjusting the position of each fan beam constituent in elevation angle, while maintaining the ends of the constituents adjacent one another to permit reorientation of the composite fan beam with respect to the horizontal plane.

4,532,520

TARGET DETECTION SYSTEMS

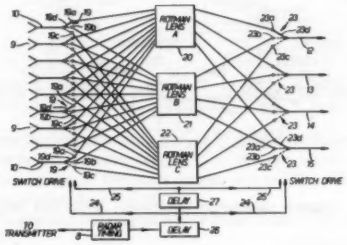
Thomas H. Hislop, Isle of Wight, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Nov. 16, 1981, Ser. No. 321,777

Claims priority, application United Kingdom, Nov. 19, 1980, 8037180; Oct. 13, 1981, 8130876

Int. Cl.³ H01Q *3/00, 3/22*

U.S. Cl. 343—373 **4 Claims**



1. A radar, lidar or sonar system comprising a transmitter and a receiver, the receiver including a radar antennae and a plurality of Rotman lenses fed therefrom via a first switch means, said lenses being arranged to feed output lines via a second switch means, said receiver adapted to form a plurality of contiguous receiver beams defining an angular sector of cover; and means for narrowing each of the beams whilst maintaining contiguity thereof including a timing unit means for timing the lapse of time after transmission of each radar pulse from said transmitter and for outputting a timing signal, said means for narrowing including a delay means for delaying the timing signal and for controlling said first and second switch means dependent upon the delayed timing signal, said means for narrowing adapted to reduce in a plurality of discrete steps said angular sector of cover of said plurality of contiguous receiver beams and to increase the range of said plurality of contiguous receiver beams.

4,532,521

RECORDING APPARATUS

Hiroshi Onoda, and Kenji Mizuno, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 5, 1984, Ser. No. 586,324

Claims priority, application Japan, Mar. 18, 1983, 58-46570; Nov. 30, 1983, 58-226482

Int. Cl.³ G01D *9/38*

U.S. Cl. 346—33 R **7 Claims**

1. A recording apparatus with a keyboard, comprising

a paper feed device for feeding a recording paper, supported on a paper support device, in forward and reverse directions;

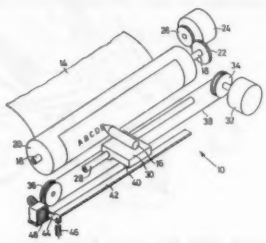
a carriage for supporting a writing tool and being movable perpendicularly to feed direction of said recording paper;

a carriage drive device for driving said carriage;

a writing tool drive device for driving said writing tool towards said recording paper;

a character pattern generator for generating character patterns;

a control device for reading out corresponding character patterns from said character pattern generator on basis of record data and driving said carriage drive device and said writing tool drive device, in response to said character patter, thereby to control said paper feed device;



change means for changing lateral direction of recording and longitudinal direction of recording; and

means for mutually changing drive signals to be supplied from said control device to said paper feed device and to said carriage drive device, respectively, on the basis of said change means.

4,532,522

OPTICAL RECORDING APPARATUS

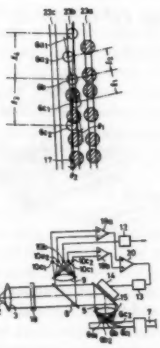
Yoshito Tsunoda, Mitaka; Takeshi Maeda, Kokubunji; Shigeru Nakamura, and Toshimitsu Kaku, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,678

Claims priority, application Japan, Aug. 28, 1981, 56-134070

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 346—44 **18 Claims**



1. In an optical recording apparatus having a light source which emits a laser beam; a recording medium on and from which predetermined information are optically recorded and played back along a guide groove provided beforehand; optical means arranged between the light source and the medium and for leading the laser beam from the light source to the recording medium; light receiving means for receiving reflected light from the recording medium; generation means for generating a tracking signal on the basis of an output from the light receiving means, the laser beam tracking the guide groove in accordance with the tracking signal; and control means for controlling the laser beam so that the laser beam may track the guide groove in accordance with the tracking signal from the generation means;

an optical recording apparatus characterized in that said optical means comprises an optical element which separates said laser beam into a first laser beam, a plurality of second laser beams and a plurality of third laser beams, and which arranges said first laser beam on said guide groove, arranges said plurality of second laser beams and said plurality of third laser beams in front and to the rear of said first laser beam respectively and along said guide groove in a manner to mutually deviate from a center of said guide groove, and arranges said second laser beams in an area with no information recorded therein and said third laser beams in an area with information recorded therein; and that said generation means comprises first means for evaluating a difference between light quantities of said plurality of second laser beams, and second means for evaluating a difference between light quantities of said plurality of third laser beams, the outputs of these means being applied to said control means.

4,532,523

TONE CONTROL FOR THERMAL INK-TRANSFER PRINTING APPARATUS

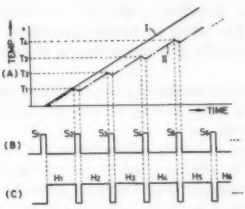
Hideshi Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 10, 1983, Ser. No. 474,197

Claims priority, application Japan, Mar. 16, 1982, 57-41191; Mar. 30, 1982, 57-50120

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—76 PH **7 Claims**



1. A tone control device in a thermal ink-transfer type printing apparatus comprising a thermal printing head having a plurality of head elements arranged in line, said plurality of head elements respectively comprising heating resistors for heating a transfer sheet adhered with a kind of ink which melts due to heat and transferring melted ink onto a recording sheet which makes contact with said transfer sheet to print images such as characters and figures, said tone control device comprising:

converting means for sampling an input analog signal indicating tone of density of an image to be printed on said recording sheet for one line according to the number n of said head elements, and converting said input analog signal into corresponding n digital data of natural binary code;

memory means for storing the output converted digital data of said converting means as they are;

second converting means repeatedly reading out the n digital data corresponding to said n head elements from the memory means k times for one line, where k is an integer greater than one, for producing control data in a form of a serial n-bit data signal every time said n digital data are read out once, each data value of the n-bit data signal being "1" or "0" depending on whether each value of the n digital data is equal to or larger than a preset value, respectively, the preset value being incremented one by one every time the n digital data are read out once;

serial-parallel converting means for converting said serial n-bit data signal of the control data into parallel n-bit data signal; and

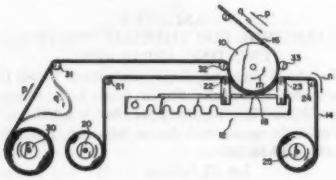
driving means receiving the parallel n-bit data signal of the control signal for supplying currents having a predetermined current value for a predetermined time duration to the head elements which correspond to the control data having the value of "1", the driving means supplying the currents every time the n digital data are read out and converted into the parallel n-bit data.

4,532,524

THERMAL INK-TRANSFER PRINTING APPARATUS

Masasumi Yana, Yokohama, and Tadayoshi Ohno, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 14, 1983, Ser. No. 485,058
Claims priority, application Japan, Jun. 29, 1982, 57-110801
Int. Cl.³ G01D *15/10*; B41J *3/20*
U.S. Cl. 346—76 PH **17 Claims**



1. A thermal ink-transfer printing apparatus comprising:

recording means including a plurality of heating elements arranged in a line along an extending direction and having means for selectively generating heat in response to picture signals;

supporting means for supporting the recording means;

a rotatable platen roller having an axis parallel with said extending direction;

means for urging one of the platen roller and the supporting means toward the other so that the peripheral surface of the platen roller is urged toward contact with the heating elements of the recording means;

an ink film having an ink layer, the ink film overlapping a recording medium, being positioned for passing through a gap between the platen roller and the recording means and moving along the circumference of the platen roller as the platen roller rotates while contacting said recording medium, so that the ink layer is selectively heated by the heat from the heating elements to transfer ink thereon to the recording medium; and

a restricting roller disposed upstream of the recording means with respect to the travelling direction of the ink film and positioned for rolling on the peripheral surface of the platen roller with an axis thereof parallel with said axis of the platen roller, the ink film passing through a gap between the restricting roller and the platen roller to be guided in a specific path, thereby preventing the ink film from being folded transversely due to thermal contraction caused by the heat from the heating elements.

4,532,525

IMAGE FORMING DEVICE

Tomohiko Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

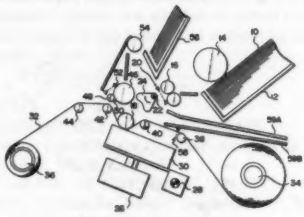
Filed May 29, 1984, Ser. No. 614,541
Claims priority, application Japan, May 31, 1983, 58-95007
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**

1. An image forming device which thermally transfers color from a transfer paper onto a sheet of paper, comprising:

a platen roller for conveying the paper sheet;

a pair of conveying rollers arranged on that side of the platen roller where the paper sheet comes out of the platen roller in a forward direction;

image forming means for forcing the transfer paper against the platen roller with the paper sheet interposed between them, and heating the transfer paper to thermally multi-



transfer color onto the paper sheet, while keeping the paper sheet conveyed in the forward direction; and

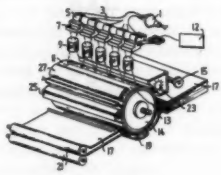
driving means for driving the conveying rollers and not the platen roller when said image forming means is made operative, and driving the platen roller rollers when said image forming means is made inoperative.

4,532,526

OPTICAL PRINTING HEAD FOR LINE-BY-LINE RECORDING OF PICTURE AND TEXT INFORMATION

Herbert Behrens, Zetel; Rainer Marx, Wilhelmshaven, and Jürgen Schmitt, Stadland, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,937
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3212519
Int. Cl.³ G01D *9/42*
U.S. Cl. 346—107 R **17 Claims**



1. An optical printing head for a printer for the line-by-line recording of graphics and text in successive parallel lines on a photosensitive record carrier disposed at a printing location, said head comprising: a plurality of actuatable optical components disposed adjacent one another in the direction of the recording lines and each constituting means for providing dot-like light elements; a plurality of objective lenses each disposed between, and having an optical axis extending between, a respective optical component and the printing location for projecting the light elements provided by said respective optical component onto the printing location along a respective portion of each printing line; and means operatively associated with each said lens for adjustably positioning each said lens individually relative to its associated optical component in at least one direction in a plane transverse to the optical axes of said lenses for precisely aligning the projected light elements provided by said optical components along each printing line.

4,532,527
OPTICAL PRINTING DEVICE

Herbert Behrens, Zetel; Rainer Marx, Wilhelmshaven, and Jürgen Schmitt, Stadland, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

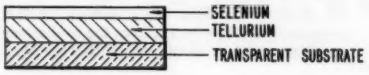
Filed Aug. 10, 1983, Ser. No. 521,939
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230110
Int. Cl.[3] G01D *9/42*
U.S. Cl. 346—108 8 Claims

1. In an optical printing device for generating a linear light pattern which is applied to a moving photosensitive recording medium, which device is composed of a plurality of subassemblies each located for providing a respective segment of the linear light pattern, each subassembly including: a unit composed of a row of generally parallel optical fibers having output ends and arranged to conduct light from a light source to their output ends, and a photocoupler composed of a thin transparent plate extending transversely of the direction of light propagation by the optical fibers and having a light entrance surface coupled to the output ends of the optical fibers to receive light therefrom, a light exit surface to which light is conducted from the light entrance surface, and lateral surfaces spaced apart in the direction of the linear pattern and extending between the light entrance and light exit surfaces, the light entrance surface being, in the direction of the linear pattern, shorter than the row of optical fibers at their output ends; a light switching element composed of a plurality of light switching cells disposed in a row in the direction of the linear pattern and positioned to receive the light emerging from the photocoupler light exit surface, the row of light switching cells being, in the direction of the linear pattern, shorter than the photocoupler light entrance surface, and the light switching cells being individually controllable for modulating the light received thereby in accordance with the resepective segment of the linear pattern; and optical means disposed for imaging the light switching cells on the recording medium, the improvement wherein each said unit is constructed to present means for causing substantially all of the light arriving at said light entrance surface of said photocoupler from the output ends of said optical fibers to be conducted to said light exit surface over a region thereof which, in the direction of the linear pattern, is shorter than said light entrance surface, with both ends of said region being spaced inwardly, in the direction of the linear pattern, from the corresponding ends of said light entrance surface, for causing the entire linear pattern on the recording medium to have an intensity which is uniform except for the variations resulting from modulation by said light switching cells.

4,532,528
ARCHIVAL OPTICAL STORAGE MEDIUM

Wen Y. Lee, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1983, Ser. No. 498,331
Int. Cl.[3] G01D *15/34*
U.S. Cl. 346—135.1 5 Claims

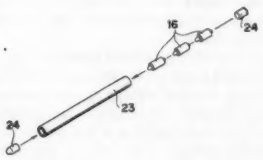


1. An archival optical storage medium comprising a transparent substrate, a layer of tellurium on top of said substrate, and on top of said layer of tellurium, a layer consisting essentially of selenium from 5 to 60 Å thick.

4,532,529
ELECTRONIC APPARATUS HAVING PRINTING MECHANISM

Hideo Fushimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,439
Claims priority, application Japan, Feb. 21, 1983, 58-26267
Int. Cl.[3] G01D *15/16;* B65H *19/00;* B43K *27/12*
U.S. Cl. 346—136 8 Claims



1. A recording device which carries out recording on recording paper by use of recording means which is detachably mounted on said device and in which printing ink is reserved, said recording device comprising:

(a) a carriage to place said recording means thereon;

(b) a supporting member for supporting said recording paper; and

(c) a housing section formed in said supporting member to receive and store therein said recording means.

4,532,530
BUBBLE JET PRINTING DEVICE

William G. Hawkins, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1984, Ser. No. 588,166
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—140 R 11 Claims

1. An improved bubble jet ink printing device having a plurality of bubble generating resistors for the production and propulsion of ink droplets towards a recording medium comprising:

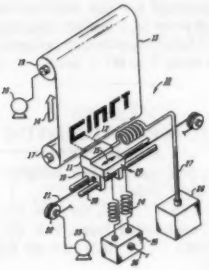
a supply of ink;

a channel plate having recesses therein which form a linear array of parallel channels, one end of each channel opening into a common manifold and the other end of each channel terminating with a nozzle, the manifold having a passageway to receive ink from the ink supply;

a dielectric substrate on which the channel plate is fixedly mounted for forming a printing head having a closed system for the containment of the ink, the system being open only through the nozzles;

means for adding and replenishing ink from the ink supply to the printing head via the manifold passageway;

bubble generating resistors being formed on the dielectric substrate prior to the mounting of the channel plate and in locations which place one resistor in each channel after the channel plate is mounted and near the nozzle associated with that channel, the resistor material being doped polycrystalline silicon, electrodes being patterned on the dielectric substrate for carrying electric current to and from the resistors, a relatively thin dielectric isolation layer having good integrity being produced on the resistor, a protective layer being formed on the dielectric isolation layer to protect it from the cavitational forces of collapsing bubbles of ink vapor, and an overcoat layer



being formed over the electrodes to prevent electrical contact between electrodes and between the electrodes and the ink; and

means for applying current pulses to selected electrodes and associated resistors in response to digitized data signals to generate thermal energy in said resistors which is transferred through the isolation and protective layers to said ink to produce bubbles of ink vapor, so that concurrently with the passage of the current pulse through the resistor, the bubble expands and expels an ink droplet from the nozzle, propelling the droplet towards the recording medium.

4,532,531

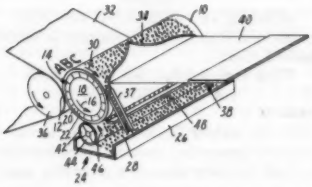
ELECTROGRAPHIC RECORDING APPARATUS

Richard W. Lindahl, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 16, 1983, Ser. No. 494,623

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **3 Claims**



1. An electrographic stylus recording apparatus for use with magnetically attractable, electronically conductive toner material including:

a nonrotatable cylindrical sleeve of nonmagnetic material;

a rotatable magnetic means disposed for rotation about its axis in one direction within said nonrotatable cylindrical sleeve, said rotatable magnetic means including alternate magnetic poles presented adjacent the inner surface of said nonrotatable cylindrical sleeve;

an imaging stylus array positioned axially of and at the outer surface of said nonrotatable cylindrical sleeve, said imaging stylus array including an insulated electrical conductor for each stylus of said imaging stylus array extending from the stylus array and positioned about the outer surface of said nonrotatable cylindrical sleeve for a portion of the circumference of said nonrotatable cylindrical sleeve with an end portion of each of said conductors positioned between the ends of said nonrotatable cylindrical sleeve and extending in a generally radial direction away from the outer surface of said nonrotatable cylindrical sleeve;

a toner material dispensing means positioned near the portion of said electrical conductors positioned about said nonrotatable cylindrical sleeve and between said imaging stylus array and the end portion of each of said electrical conductors extending away from the outer surface of said nonrotatable cylindrical sleeve, said toner material dispensing means including a hopper for receiving a supply of toner material that is magnetically attractable and electronically conductive, said rotatable magnetic means attracting toner material from said toner dispensing means to said nonrotatable cylindrical sleeve and moving such attracted toner material to said imaging stylus array in response to rotation of said rotatable magnetic means;

a flange means spirally disposed at the outer surface of said nonrotatable cylindrical sleeve and extending to at least one end portion of said nonrotatable cylindrical sleeve for receiving toner material that is moved beyond said imaging stylus array and over the outer surface of said nonrotatable cylindrical sleeve when said rotatable magnetic means is rotated; and

pathway means positioned between said hopper and said flange means providing a pathway to allow the toner material received at said flange means to fall by gravity into said hopper from said flange.

4,532,532

SUBMICRON CONDUCTOR MANUFACTURING

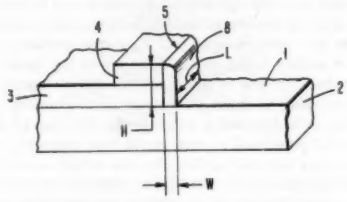
Thomas N. Jackson, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 454,915, Dec. 30, 1982, abandoned.

This application Aug. 27, 1984, Ser. No. 644,845

Int. Cl.³ H01L *29/48, 29/80*

U.S. Cl. 357—15 **9 Claims**



1. In submicrometer dimension planar technology,

a semiconductor device electrical conductor comprising in combination

a first planar dielectric member on the surface of a substrate containing a semiconductor device and having a portion thereof terminating at a face essentially perpendicular to said substrate surface,

a second planar member of metal positioned over said first dielectric member having a portion thereof terminating and forming a boundary at a face essentially an extension of said terminating face of said dielectric member, and

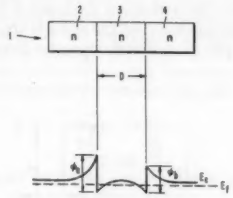
a third member of metal electrically contiguous at said boundary with said second metal member and covering said first and second terminating faces.

4,532,533

BALLISTIC CONDUCTION SEMICONDUCTOR DEVICE

Thomas N. Jackson, Ossining, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,359
Int. Cl.³ H01L 29/34, 29/205
U.S. Cl. 357—16 4 Claims



1. A monocrystalline three coplanar region transistor device comprising in combination

a central monocrystalline base region having a high particular extrinsic conductivity

positioned between emitter and collector external coplanar region interfaces,

said central region having a distance between said interfaces of the order of the mean free path of an electron in the material of said base region,

a first emitter external region of a first semiconductor material of said particular extrinsic conductivity type,

forming a heterojunction with said base region at said emitter interface,

said first semiconductor material having the Fermi level thereof pinned in the forbidden region at a value with respect to the conduction band level thereof to produce a first barrier height at said emitter interface, and

a second collector external region of a second semiconductor material of said particular extrinsic conductivity type,

forming a heterojunction with said base region at said collector interface,

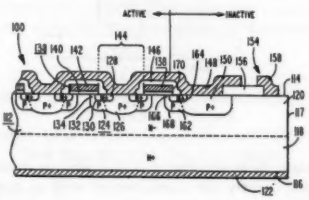
said second semiconductor material having the Fermi level thereof pinned in the forbidden region at a value with respect to the conduction band level thereof to produce a second barrier height less than said first barrier height at said collector interface.

4,532,534

MOSFET WITH PERIMETER CHANNEL

Raymond T. Ford, Mountaintop, Pa.; Norbert W. Brackelmanns, Ironia, N.J.; Carl F. Wheatley, Jr., Drums, and John M. S. Neilson, Norristown, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 7, 1982, Ser. No. 415,486
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23.4 4 Claims



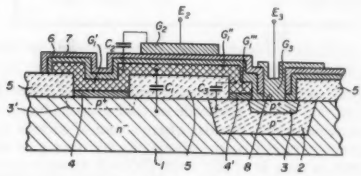
1. A device in accordance with claim 1 wherein each body region is hexagonal in shape at said major surface.

4,532,535

ELECTRICALLY REPROGRAMMABLE NON VOLATILE MEMORY CELL FLOATING GATE EEPROM WITH TUNNELING TO SUBSTRATE REGION

Bernard Gerber, and Jean Fellrath, both of Neuchatel, Switzerland, assignors to Centre Electronique Horologer, S.A., Neuchatel, Switzerland

Continuation of Ser. No. 129,324, Mar. 11, 1980, abandoned.
This application Aug. 16, 1982, Ser. No. 408,275
Claims priority, application Switzerland, Mar. 14, 1979, 2404/79
Int. Cl.³ H01L 29/78, 27/04; G11C 11/40
U.S. Cl. 357—23.5 2 Claims



1. An electrically erasable and reprogrammable non volatile memory cell implemented in CMOS polycrystalline silicon gate transistor technology comprising a p-channel MOS transistor and a floating electrode, said MOS transistor having a floating gate placed on a gate oxide layer, said gate forming a first portion of said floating electrode, a second portion of said floating electrode having a surface substantially larger than that of said gate and being placed on a field oxide layer of substantially greater thickness than that of said gate oxide layer, a third portion of said floating electrode being separated from said p-channel MOS transistor having a surface substantially similar to that of said first portion and being placed on an injection oxide layer of smaller thickness than that of said gate oxide layer, a p-doped well being formed in the substrate under said third portion of the floating electrode and being connected through a p^+-doped region to write-control electrode, an erase control electrode being arranged in facing relationship to said second portion of the floating electrode and being separated therefrom by at least one insulating oxide layer, the arrangement providing a capacitance between the erase control electrode and said second portion of the floating electrode which is greater than the capacitance between said floating electrode and the substrate or said p^--doped well, and wherein said second portion of the floating electrode is made of n^+-doped polycristalline silicon, and wherein an n^+-doped region is formed in said p^--doped well, said n^--doped region overlapping in part said injection oxide layer and contacting said p^+-doped region connected to said write control electrode whereby said floating gate may be negatively charged or discharged by the application of an appropriate voltage between said erase- and write-control electrode to cause a Fowler-Nordheim tunneling current to flow through said injection oxide layer between said p^- doped well and said third portion of said floating electrode.

4,532,536

PHOTO-ELECTRIC TRANSDUCER

Katsunori Hatanaka, Yokohama, and Shunichi Uzawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,892
Claims priority, application Japan, Oct. 23, 1980, 55-149075
Int. Cl.³ H01L 27/14, 45/00, 29/78, 27/02
U.S. Cl. 357—30 19 Claims

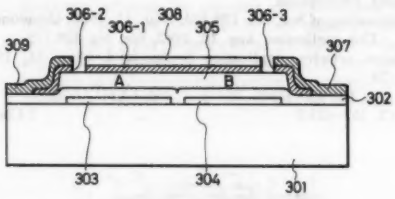
1. A photo-electric transducer having a photoelectric transducing element comprising:

a semiconductor layer formed of a photosensitive semiconductor material;

first and second gate electrodes juxtaposed on said semiconductor layer through an insulating layer;

a drain electrode disposed outside of said first gate electrode;

a source electrode disposed outside of said second gate electrode; and



an output electrode disposed between said drain electrode and said source electrode on said semiconductor layer to provide output signals, wherein one of an area A of said semiconductor layer opposed to said first gate electrode and an area B of the same opposed to said second gate electrode is formed as a light incidence part and the other area is formed as a non-light incidence part.

4,532,537

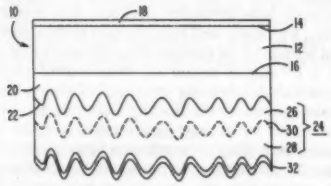
PHOTODETECTOR WITH ENHANCED LIGHT ABSORPTION

James Kane, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,137

Int. Cl.³ H01L *31/02*

U.S. Cl. 357—30 **18 Claims**



1. A photodetector comprising:

a light transmissive substrate having a smooth surface;

a light transmissive first electrical contact, overlying said smooth surface, said first contact having a randomly textured surface which has a dominant peak-to-valley roughness greater than about 100 nanometers and a thickness greater than about 250 nanometers; and

a semiconductor body overlying the textured surface of the first electrical contact.

4,532,538

SEMICONDUCTOR ARRANGEMENT WITH CONNECTOR CONDUCTORS CUT OUT OF SHEETMETAL

Erwin Wurz, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin und Munich, Fed. Rep. of Germany

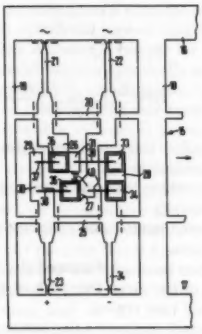
Filed Feb. 8, 1982, Ser. No. 347,030

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106379

Int. Cl.³ H01L *25/02, 23/48*

U.S. Cl. 357—70 **1 Claim**

1. A rectifier bridge having four semiconductor members comprising four connector conductors cut out of sheetmetal, a first one of said connector conductors (23) having a first support point (29) for a first bond wire (37) and a second support point (30) for a second bond wire (38), a second one of said connector conductors (21) having a contact surface (26) whereon a first one of the four semiconductor members (35) is seated and a support point (31) for a third bond wire (39), a third one of said connector conductors (22) having a contact surface (27) for a second one of the four semiconductor members (36) and a support point (32) for a fourth bond wire (40), a fourth one of said connector conductors (24) having a contact surface (28) whereon a third and a fourth one of the four semiconductor members (33 and 34) are seated; said first support point (29) on said first connector conductor (23), said



contact surface (26) on the first semiconductor member (35), said support point (31) on said second connector conductor (21) and said contact surface (28) for the third semiconductor member (33) being serially connected, said first bond wire (37) and said third bond wire (39) being in tandem alignment with one another; said second support point (30) of said first connector conductor (23), said contact surface (27) for the second semiconductor member (36), said support point (32) of said third connector conductor (22) and said contact surface (28) for the fourth semiconductor member (34) being serially connected, said second bond wire (28) and said fourth bond wire (40) being in tandem alignment with one another.

4,532,539

SOLID-STATE DIODE-RECTIFIER AND HEAT SINK STRUCTURE

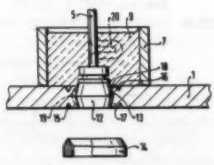
Manfred Frister, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,919

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1981, 3134307; Nov. 21, 1981, 3146227

Int. Cl.³ H01L *23/34, 23/32, 27/02*

U.S. Cl. 357—81 **10 Claims**



1. Solid-state diode-rectifier and heat sink or cooling plate structure, particularly for combination with a mobile-type alternator, to supply direct current power to a self-contained d-c network, having a chip (4) of semiconductor material and a heat sink body,

wherein, in accordance with the invention,

the heat sink body comprises an aluminum support or attachment plate (1) secured to an aluminum post (2) and the side of the chip (4), which is to be subjected to cooling, is secured to at least one of the plate (1) and the post (2),

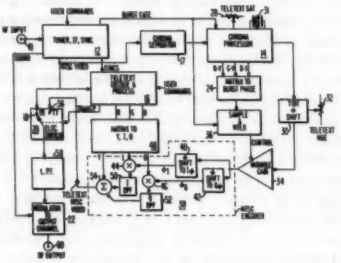
the aluminum support or attachment plate (1) is formed with an opening (13); and

said aluminum post (2) has, at least in part, a double-conical surface portion (12) to provide an outer circumferential surface of varying diameter, said portion (12) being fitted in said opening, and the support or attachment plate (1) having engaging portions fitting around the post in the region of said portion of varying diameter to provide an interlocking engaging fit between the plate (1) and the post (2).

4,532,540
TELETEXT SET-TOP CONVERTER WITH TRANSPARENT MODE

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,450
Int. Cl.³ H04N 9/32
U.S. Cl. 358—12 11 Claims



1. Apparatus for use with a composite color television signal that contains a color burst signal, a teletext video signal, and a color encoded signal containing color picture information that is encoded with a color subcarrier signal having a first constant phase relationship with said color burst signal using a given color phase encoding rule, said apparatus comprising:

decoding means for decoding said color burst signal from said composite color television signal to produce a first signal therefrom that has a second constant phase relationship with said color subcarrier signal;

converting means for converting said teletext video signal from said composite color television signal into a teletext component signal that is capable of containing color information;

encoding means responsive to said first signal for encoding the color information of said teletext component signal into a second encoded television signal, wherein the color information of said teletext component signal is encoded in said second encoded television signal with said first signal using said given color phase encoding rule; and

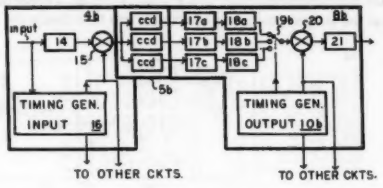
selecting means for selecting between said composite color television signal and said second encoded television signal.

4,532,541
APPARATUS AND METHOD FOR CORRECTING TIMEBASE ERRORS

J. Carl Cooper, 1373 Sydney, Sunnyvale, Calif. 94087

Filed Sep. 20, 1982, Ser. No. 420,597
Int. Cl.³ H04N 5/14
U.S. Cl. 358—21 R 18 Claims

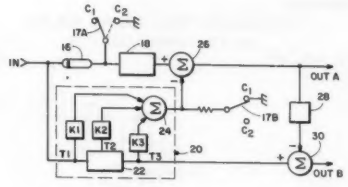
1. A clocked analog delay circuit for use in a timing error correcting device for delaying an input analog electronic signal, including in combination: at least two clocked delay paths responsive one at a time to receive said input signal; and connected in a series fashion in each delay path a delay compensation circuit, said compensation circuit operative to allow adjustment of the delay time of each delay path in order that delay times of all said delay paths may be matched.



4,532,542
COMB FILTERS

Gary D. Andrews, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 1, 1983, Ser. No. 481,187
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 2 Claims



1. A filter circuit for processing a composite video signal including a chrominance component and a luminance component, said filter circuit comprising a series circuit of delay means for delaying an input composite video signal for the duration of one line of the video signal and a first bandpass filter connected to the delay means to receive the delayed video signal, and the filter circuit also comprising a transversal bandpass filter for receiving the input composite video signal and providing as outputs a delayed composite video signal and a delayed chrominance component, first summing means for summing the delayed chrominance component and the output of the series circuit, second summing means for summing the delayed composite video signal and the output of said first summing means, and means which are operable selectively for disabling said series circuit so as not to apply a delayed video signal to the first summing means.

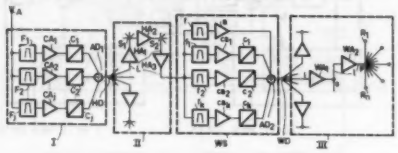
4,532,543
HIGH CHANNEL DENSITY COMMUNITY ANTENNA ARRANGEMENT HAVING LOW INTERMODULATION PRODUCTS

Willem F. M. Groenewegen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,563
Claims priority, application Netherlands, Dec. 14, 1981, 8105609
Int. Cl.³ H04N 7/10; H04H 1/06
U.S. Cl. 358—86 5 Claims

1. A community antenna arrangement for a frequency-division multiplex transmission of at least four television signals, comprising a frequency-conversion arrangement connected to a distribution network for converting the frequency distribu-

tion of the television signals from an input channel pattern to an output channel pattern, in which output channel pattern the picture carriers of the television signals succeed each other with frequency spacings of which not more than two consecutive frequency spacings are mutually equal, characterized in that the largest frequency spacing is less than twice the smallest



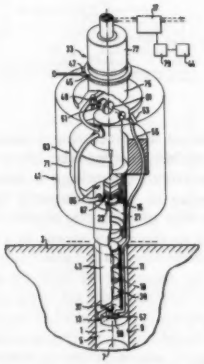
frequency spacing and each of the frequency spacings is an integer multiple of a frequency interval, which frequency interval is at least substantially equal to 1.75 MHz for TV-signals of the CCIR-standards B, G and H, 1.7 MHz for TV-signals of the CCIR-standard L, 1.4 MHz for TV-signals of the CCIR-standard M and 1.8 MHz for TV-signals of the CCIR-standard I.

4,532,544

LINE-SCAN PANORAMIC CAMERA

Gregor Federau, Eichenstrasse 86, 2000 Hamburg 19, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,404
Int. Cl.[3] H04N *3/15, 3/34*
U.S. Cl. 358—87 **10 Claims**



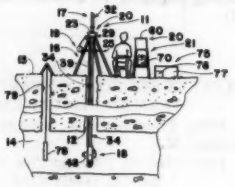
1. A television camera for digital on-line image processing, comprising an optical imaging system which images an object area sensed by the camera into an image area adapted to be scanned element by element, and a processing circuit which produces video signals from the signals obtained with the scanning, the camera comprising a line sensor arranged in the optical image area (15), the line sensor being composed of sensor faces of a row of optical-electrical transducers (27) so that the sensor faces are disposed in the optical images of correspondingly set-off elements (29) of the object area and each sensor face (25) defines, upon movement of the line sensor relative to the object area perpendicularly of the length of the line sensor, a scanning line (31), characterized in that for sensing an optical object distributed about a panoramic axis (1), and for producing the relative movement, the line sensor (23) is rotatively drivable about the optical image (21) of the panoramic axis (1) and is arranged so that the sensor faces are disposed in the optical images of axially set-off elements (29) of the object area (13), and each sensor face (25) defines, upon rotation of the line sensor, a scanning line (31) having rotative symmetry with respect to the panoramic axis (1), and in that the output of the line sensor (23) is connected to the processing circuit (17) via a multi-channel optical contactless rotary joint (33).

4,532,545

SUBTERANEAN SURVEYING APPARATUS

Lowell C. Hanson, P.O. Box 299, 3108 McHugh Dr., Helena, Mont. 59624

Filed Aug. 29, 1983, Ser. No. 527,100
Int. Cl.[3] H04N *7/18*
U.S. Cl. 358—100 **20 Claims**



1. Subteranean surveying apparatus including a support portion, a connector portion, an instrument housing portion, an instrument positioning portion, an instrument monitoring portion and an instrument control portion; said support portion including a horizontal reference surface, a base section extending downwardly from said reference surface, means for leveling said reference surface; said connector portion including a torsionally rigid mast assembly, said mast assembly being suspended from said reference surface and extending downwardly therefrom, means for selectively fixing the position of said mast assembly with respect to said reference surface, said mast assembly including a plurality of elongated members disposed in an end to end relationship, said elongated members including end sections securable to adjoining ends of other elongated members; said instrument housing portion including an elongated hollow section, the upper end of said hollow section being affixed to the lower end of said mast assembly, at least one opening in said hollow section intermediate the ends thereof, a television camera disposed within said hollow section adjacent said opening, a light source disposed adjacent to said camera; said instrument positioning portion including lifting means mounted on said support portion base section, said lifting means being connected to said instrument housing portion; said instrument monitoring portion including a television receiver located adjacent to said support portion, indexing means disposed adjacent to said reference surface, said indexing means being connected to the upper end of said mast assembly for determining the orientation of said camera; said instrument control portion including control means for said camera and for said light source, a power source for said apparatus; whereby said support portion can be set up over a ground borehole, said instrument housing portion lowered into said borehole and an operator can survey the bottom of said borehole while positioned on the surface adjacent to said apparatus.

4,532,546

REAL TIME SINGLE FRAME MEMORY FOR CONVERTING VIDEO INTERLACED FORMATS

James M. Aufiero, Reading; William P. D'Agostino, Jr., Bedford, and John P. Moore, Arlington, all of Mass., assignors to Itek Corporation, Lexington, Mass.

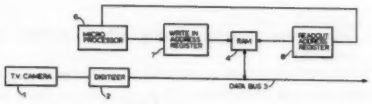
Filed Jan. 4, 1984, Ser. No. 568,168
Int. Cl.[3] H04N *5/32*
U.S. Cl. 358—111 **16 Claims**

1. Circuitry for converting in real time, from an interlaced to a non-interlaced format, successive frames of video data supplied to a single frame memory comprising:

A. data control means including memory writein and readout address means for:

a-1: initially sequentially addressing portions of said memory to cause loading of memory portions of said memory with lines of interlaced video data of a first frame sequentially applied to said memory;

a-2: thereafter sequentially addressing said memory to cause reading out of lines from successive memory portions of said memory by incrementing said readout means by an incrementing factor of N/2, where N is the number of lines in each frame, while replacing each line readout by whatever line of a second frame is applied to said memory in real time just after readout, until all lines of data of said second frame are inserted into said memory;



a-3: thereafter incrementing said readout means by an incrementing factor of N/4 and sequentially reading out each line of said second frame from said memory while replacing each line readout by whatever line of a third frame is applied to said memory in real time just after readout, until all lines of data of said third frame are inserted into said memory;

a-4: reading out and replacing data of subsequent frames in like manner while multiplying the denominator of said incrementing factor by two for each subsequent frame readout until said factor would be less than unity and thereafter;

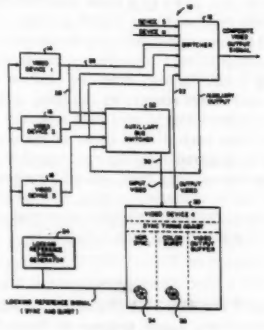
a-5: increasing said incrementing factor back to N/2, and thereafter repeating steps a-2, a-3, and a-4 to readout and replace data of subsequent frames.

4,532,547

VIDEO DEVICE SYNCHRONIZATION SYSTEM

Phillip P. Bennett, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 31, 1982, Ser. No. 363,670
Int. Cl.³ H04N *5/04, 9/44, 5/22*
U.S. Cl. 358—148 **18 Claims**



1. A video device synchronization system comprising:

a phase detector coupled to receive a first video device synchronization signal and a locking reference signal and generate a phase difference signal indicative of any phase difference therebetween; and

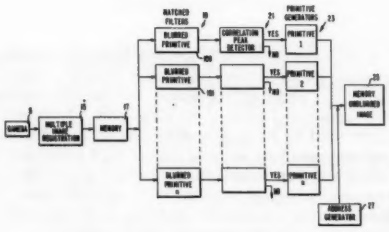
a signal generator coupled to receive a second video device synchronization signal and a phase difference command signal that is responsive to the phase difference signal and generate, as an output, a video synchronization signal having a phase difference relative to the second video device synchronization signal received by the signal generator indicated by the phase difference command signal.

4,532,548

RESOLUTION ENHANCEMENT AND ZOOM

Robert Zwirn, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 27, 1983, Ser. No. 461,298
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—166 **10 Claims**



1. In an imaging system comprising an imager which may view a scene through an aperture characterized by a point spread function and means responding to said imager for generating successive frames of video data words characterized by a first sampling rate, a system for enhancing image resolution, comprising:

means for converting said video data words into a synthesized video frame of video data words, said synthesized video frame characterized by a second higher sampling rate;

a plurality of image primitives, each of said image primitives comprising a matrix of video data words;

means for convolving each of said image primitives with said point spread function to generate a set of blurred image primitives;

means for computing the correlation between each of said blurred image primitives and a segment of said synthesized video frame and detecting a peak correlation therefrom wherein said segment is a selected portion of said synthesized video frame;

a memory for storing a mosaic of selected image primitives; and

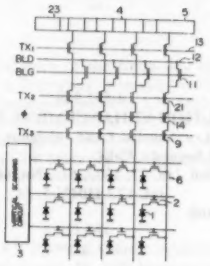
means, responsive whenever said correlation means detects a two-dimensional peak correlation between a particular one of said blurred image primitives and one segment of said synthesized video frame, for writing a particular one of the unblurred ones of said image primitives into said image primitive mosaic storage memory at a location corresponding to the original location of said particular synthesized video frame segment in said synthesized video frame.

4,532,549

SOLID-STATE IMAGING DEVICE WITH HIGH QUASI-SIGNAL SWEEP-OUT EFFICIENCY AND HIGH SIGNAL CHARGE TRANSFER EFFICIENCY

Toshifumi Ozaki, Tokyo; Shinya Ohba, Kanagawa; Iwao Takemoto, Tokyo; Masaaki Nakai, Tokorozawa; Haruhisa Ando; Shusaku Nagahara, both of Hachioji; Takuya Imaide, Yokohama; Kenji Takahashi, and Toshiyuki Akiyama, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 473,865
Claims priority, application Japan, Mar. 15, 1982, 57-39368
Int. Cl.³ H01N *3/14*
U.S. Cl. 358—213 **4 Claims**



1. A two-dimensionally arrayed solid-state imaging device wherein photo-electric conversion elements arranged in a matrix at a photo-setting section are vertically scanned by a shift register and horizontally scanned by a horizontal register constructed by a charge transfer device, and quasi-signals on vertical signal lines are read out during a hozizontal blanking period and then signals on said vertical signal lines are read into said horizontal register, and said horizontal register is driven during a horizontal scanning period to read out said signals, the solid-state imaging device comprising:

bias charge storage means and quasi-signal sweep-out drains disposed between said horizontal register and said vertical signal lines; and

bias charge input means arranged in said horizontal register;

wherein bias charges supplied from said bias charge storage means are used to transfer charges from said vertical signal lines to said bias charge storage means, wherein bias charges directly injected from said quasi-signal sweep-out drains are used to sweep out quasi-signals from siad bias charge storage means to said quasi-signal sweep-out drains, and further wherein bias charges supplied from said bias charge input means are used to read signals from said bias charge storage means into said charge transfer device.

4,532,550

EXPOSURE TIME CONTROL FOR A SOLID-STATE COLOR CAMERA

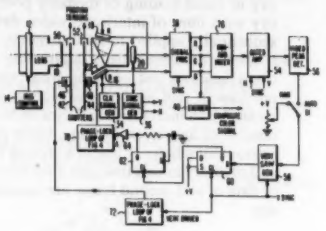
Sidney L. Bendell, and Cydney A. Johnson, both of Burlington, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 31, 1984, Ser. No. 575,570
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **21 Claims**

1. A television camera, comprising:

solid-state image transducing means including a photosensitive surface for generating signal in response to received radiant energy from a scene during an integration interval; and

optical shutter means arranged to block radiant energy from said scene from reaching said photosensitive surface during all of a television field except during a portion of said integration interval, said optical shutter means being automatically controllable in response to the level of said received radiant energy for varying that portion of said integration interval during which radiant energy is blocked.

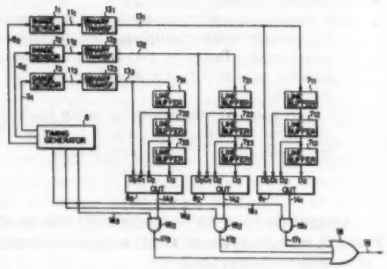


4,532,551

PICTURE INFORMATION READING APPARATUS

Masami Kurata, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,460
Claims priority, application Japan, Jan. 8, 1982, 57-914
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—293 **3 Claims**



1. A picture information reading apparatus, comprising; a plurality of linear image sensors for dividing one line of picture information into parts in a main scanning direction, so as to respectively read said one line of picture information in said parts, and picture signal delaying means provided respectively corresponding to said plurality of linear image sensors, for correcting a subscanning direction shift in reading positions between said image sensors by delaying picture signals by an amount corresponding to said shift, whereby the picture signal produced from each of said linear image sensors is corrected by said picture signal delaying means so that corrected picture signals are successively read, wherein each said picture signal delaying means comprises a data selector and a plurality of serially connected shift registers, an output of each said register being applied to said data selector.

4,532,552

LASER ACTIVATING SYSTEM FOR LASER PRINTING

Masaki Uno, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

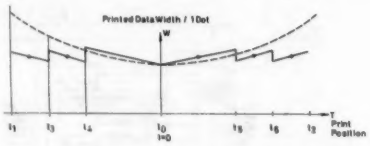
Filed Jan. 17, 1983, Ser. No. 458,582
Claims priority, application Japan, Jan. 20, 1982, 57-7822
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—302 **8 Claims**

1. An apparatus for recording the information content of an electrical signal on the surface of a light sensitive medium as a plurality of print dots of substantially constant print dot widths

by means of a plurality of scan traces across said medium comprising:

source means for providing a light beam of high intensity modulated in accordance with electrical information supplied thereto, said light beam generating said scan traces across said medium;

actuate means for actuating the source means and generating sync signals, said sync signals controlling the print dot widths generated by said light beam, said actuate means



being responsive to variations in scanning speeds of the light beam impinging on the medium to alter the periods of said sync signals and the associated print dot widths;

reflector means having a plurality of contiguous reflective faces rotatable about a central axis;

rotation means for rotating said reflector means about said central axis; and

lens means, disposed between said source means and said reflector means, for receiving and passing through said light beam.

4,532,553

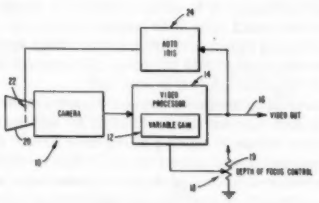
CONTINUOUS DEPTH OF FOCUS CONTROL

Gerow D. Brill, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 364,719, Apr. 2, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 703,443

Int. Cl.³ H04N *5/26*

U.S. Cl. 358—228 **3 Claims**



1. A method of changing the depth of focus of a television camera having an output video signal, an iris control and a variable gain control, comprising:

setting an initial depth of focus commensurate with a related iris setting and an initial video signal level;

purposely adjusting the gain control to provide a depth of focus control signal commensurate with a desired second depth of focus, which varies accordingly the video signal level;

simultaneously varying the iris setting in response to the variation in the video signal level to maintain the initial video signal level; and

varying the depth of focus in response to the variation in iris setting caused by the depth of focus control signal to provide a corresponding change in the desired second depth of focus while maintaining the initial video signal level.

4,532,554

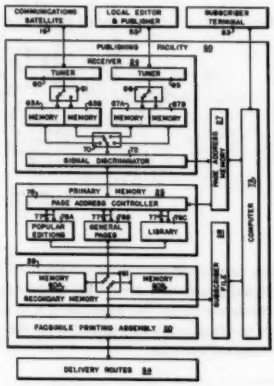
FACSIMILE PUBLISHING SYSTEM

Stephen F. Skala, 3839 S. Wenonah, Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 385,915, Jun. 7, 1982, Pat. No. 4,417,252. This application Jan. 10, 1983, Ser. No. 440,501

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—257 **30 Claims**



1. A process for publishing custom facsimile publications for a plurality of subscribers, comprising the steps of:

receiving page signals, each said page signal comprising a facsimile signal portion and an identifying code portion,

storing the page signals such that the facsimile signal is associated with the identifying code,

storing for each subscriber page selections as a portion of the identifying code,

reading the page selections for one subscriber and matching the portion of the identifying codes thereof with the identifying codes of the stored page signals to identify the associated facsimile signals,

reading the identified facsimile signals for transfer to a facsimile printing assembly to print a custon publication for said one subscriber, and

repeating the reading of the page selections for other subscribers and the subsequent steps so that custom publications are printed for the other subscribers.

4,532,555

VIDEO REPRODUCING APPARATUS

Kikuo Sagara, and Masanori Kojima, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,509

Claims priority, application Japan, Feb. 13, 1982, 57-23126

Int. Cl.³ H04N *5/76, 9/493, 9/44*

U.S. Cl. 358—310 **9 Claims**

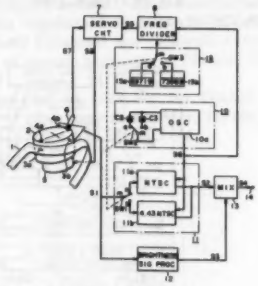
1. A video reproducing apparatus adapted for reproducing a television signal of two or more television standard systems, each having a predetermined color subcarrier frequency and a predetermined vertical reference frequency, at least one of said predetermined color subcarrier frequency and said predetermined vertical reference frequency being different among said television standard systems, said video reproducing apparatus comprising:

extracting means for extracting a video signal recorded in a recording medium for providing a reproduced signal,

color signal processing means coupled to said extracting means for processing a color signal in said reproduced signal to be in accord with the respective television standard systems,

color reference signal generating means coupled to said

color signal processing means for providing a color reference signal of the frequency associated with the respective television standard systems, and



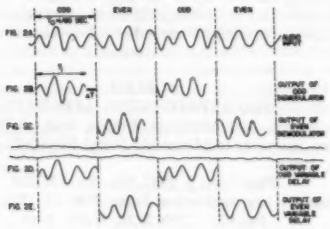
frequency dividing means coupled to said color reference signal generating means for frequency dividing said color reference signal for generating a vertical reference signal of the frequency associated with the respective television standard systems.

4,532,556

TIME-BASE CORRECTION OF AUDIO SIGNALS IN VIDEO TAPE RECORDERS

Kenneth J. Gundry, San Francisco, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed May 20, 1983, Ser. No. 496,499
Int. Cl.³ H04N *5/782, 5/95*
U.S. Cl. 360—19.1 **10 Claims**



1. An apparatus for correcting the time base of audio signals reproduced from a video tape on which video signals, audio signals and a reference signal of known frequency have been recorded in consecutive or overlapping segments and wherein, upon reproduction, the audio signals and the reference signal are time distorted by substantially the same proportion, said apparatus comprising:

control means responsive to the reproduced reference signal for generating at least one control signal;

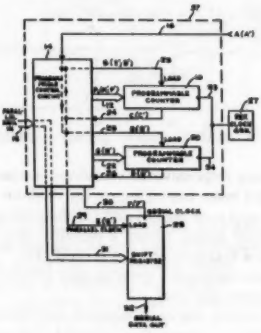
variable delay means responsive to said at least one control signal for processing the reproduced audio signals so that waveform discontinuities at the junctions of the audio signal segments are substantially eliminated without correcting the time-base of reproduced video signals.

4,532,557

SYNCHRONOUS PROGRAMMABLE PARALLEL-TO-SERIAL DATA CONVERTER AND A PROGRAMMABLE LONGITUDINAL TIME CODE GENERATOR UTILIZING THE CONVERTER

David N. Larkins, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1983, Ser. No. 483,326
Int. Cl.³ G11B *5/06, 27/14;* **H04N** *5/78*
U.S. Cl. 360—33.1 **4 Claims**



1. A programmable time code generator circuit receiving a time code signal in the form of parallel data and providing a longitudinal time code in serial data form to be recorded on a magnetic medium synchronously with an information signal having a synchronizing signal of a known frequency recorded therewith, comprising:

a programmable control means coupled to receive said synchronizing signal and to store a first and a second integral count, respectively;

a first programmable counter means coupled to said programmable control means to receive said stored first integral count therefrom in response to said synchronizing signal, said first counter means coupled to count at a known frequency to obtain a first time interval having a predetermined ratio with respect to a period of said synchronizing signal, said first counter means applying a first control signal to said programmable control means when said first time interval is obtained;

a second programmable counter means synchronous with said first counter means coupled to said programmable control means to receive in response to said first control signal said stored second integral count to obtain a second time interval having an integral number ratio with respect to said first time interval, said second counter responsively providing a second control signal when said second time interval is obtained; and

a parallel-to-serial data converter means coupled to receive said time code signal in the form of parallel data having a known number of bits, synchronously with said first control signal and to provide a longitudinal time code signal in the form of serial data synchronously with said second control signal.

4,532,558

PICTURE RECORDING APPARATUS

Tadashi Oota, Tokyo, and Koichiro Kawamura, Shonancho, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

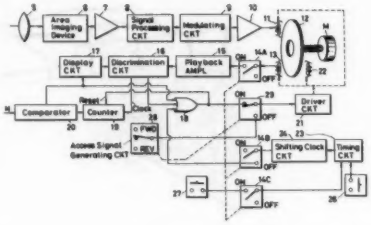
Filed Apr. 21, 1983, Ser. No. 487,215
Claims priority, application Japan, Apr. 27, 1982, 57-69499
Int. Cl.³ H04N *5/78*
U.S. Cl. 360—35.1 **12 Claims**

1. A picture recording apparatus comprising:

a photographing optical system;

image pickup means for photoelectrically converting an image of an object formed by said optical system to a still picture signal;

memory means having a plurality of memory units including at least one first memory unit and one second memory unit, each of said memory units being capable of storing a still picture signal;



means for generating a reference signal; and

discriminating means for comparing a signal reproduced from said still picture signal memory means with said reference signal and for determining whether a still picture signal stored in said first memory unit is "good" or "bad".

4,532,559

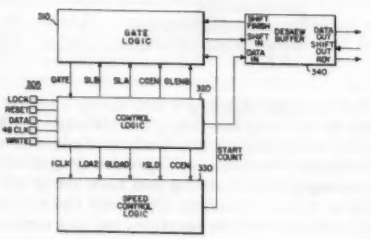
APPARATUS FOR DECODING PHASE ENCODED DATA

Charles C. Lonc, Holliston; David M. Lounsbury, Boston, and Richard R. Curtin, Milford, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1983, Ser. No. 466,332

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—51 **39 Claims**



1. In apparatus for decoding phase encoded data having data transitions and phase transitions, said apparatus having means for detecting data transitions, phase-locked loop circuitry responsive to said data for producing signals indicative of the predicted time of detection of each of said data transitions, the improvement comprising;

means responsive to said data transitions and to said indicating signals for adjusting the predicted time of detection of one of said data transition in response to a running average of the difference between the predicted detection time and the actual detection time for at least two previous data transitions, and

means for limiting the amount of adjustment made by said adjusting means to a predetermined maximum change.

4,532,560

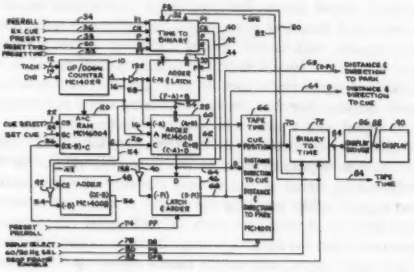
APPARATUS AND METHOD FOR INDICATING TAPE TIME

Marshall Williams, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,890

Int. Cl.³ G11B *15/18, 27/14*

U.S. Cl. 360—72.3 **38 Claims**



22. A method of indicating tape time, comprising the steps of:

receiving a signal corresponding to movement of a magnetic tape in a magnetic tape recording/reproducing device, and responsively providing a tape time signal corresponding to the position of said magnetic tape in said device with respect to a selected reference position;

receiving a preset or reset signal corresponding to a change in said reference position;

providing an offset signal as a difference between said tape time signal coincident with the time of receiving said preset or reset signal and between said preset or reset signal, respectively;

storing said offset signal until a new preset or reset signal is obtained; and,

modifying a current value of said tape time signal by said offset signal to obtain a modified tape time signal with respect to said change in said reference position.

4,532,561

PLAYBACK SPEED CONTROL SYSTEM

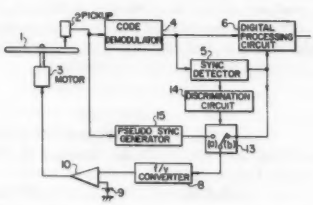
Hiroyuki Kimura, Yokohama; Yoshimi Iso; Shigeki Inoue, both of Toyokawa; Takashi Takeuchi, Fujisawa, and Shin-ichi Ohashi, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,209

Claims priority, application Japan, Sep. 30, 1981, 56-153701; Sep. 30, 1981, 56-153703; Sep. 30, 1981, 56-153707; Mar. 10, 1982, 57-36368

Int. Cl.³ G11B *15/52, 19/28*

U.S. Cl. 360—73 **12 Claims**



1. A reproduction speed control system for a signal reproducing apparatus comprising a speed control system which

controls the reproduction speed in accordance with a signal obtained by comparing the output of a speed detection means with a reference signal in a comparison means providing an output for controlling the reproduction speed of said signal reproducing apparatus in accordance therewith, said signal reproduction apparatus being a signal reproduction apparatus for a recording medium on which are recorded digital data including synchronizing signals said speed detection means including circuit means for receiving a reproduced signal of the recorded data and providing a plurality of reproduction speed signals, said circuit means including a synchronizing signal detector which detects the synchronizing signal in the reproduced signal and a specific pulse detector which detects specific pulses other than the synchronizing signal in the reproduced signal, and a switch means for selecting the output of said specific pulse detector during the operation of said signal reproduction apparatus outside the detection range for the synchronizing signal as one of said plurality of reproduction speed signals, while selecting the output of said synchronizing signal detector during operation of said signal reproduction apparatus within the detection range therefor as another reproduction speed signal, said switch means supplying the selected reproduction speed signal as a feedback signal to said comparison means, thereby to control the reproduction speed.

4,532,562

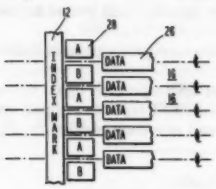
SERVO CONTROL OF SEEK OPERATION IN MAGNETIC DISK DRIVE

Steven H. Powell, Ogden, Utah, assignor to Iomega Corporation, Ogden, Utah

Division of Ser. No. 257,484, Apr. 24, 1981, Pat. No. 4,439,800. This application Nov. 25, 1983, Ser. No. 554,897

Int. Cl.³ G11B *21/08*

U.S. Cl. 360—78 **5 Claims**



1. A method of controlling the motion of a read/write head juxtaposed to a magnetic recording disk having permanently recorded position information data recorded at spaced locations thereon, comprising the steps of:

generating a series of commands predicated on the motion commanded, for successive comparison with actual position signals output by servo mechanism means controlling the position of said head;

said series of commands being generated by selection of portions of stored command sequences, and addition of calculated numbers of additional commands;

said selection and said addition steps being performed in response to each motion command.

4,532,563

CASSETTE TAPE TENSIONING DEVICE

Hiroo Edakubo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,301

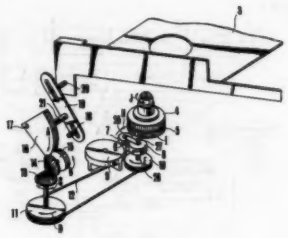
Claims priority, application Japan, May 18, 1981, 56-75481

Int. Cl.³ G11B *15/43*

U.S. Cl. 360—96.5 **5 Claims**

1. A cassette tape apparatus for handling a cassette which has a pair of reel hubs and which houses a recording medium in the form of a tape wound around said pair of reel hubs, comprising:

a cassette holder for holding therein said cassette, said cassette holder being movable by only the motive power occurring by a manual operation from a first position to a second position, said first position being a position for receiving said cassette;



a pair of reel shafts arranged to engage with said pair of reel hubs when said holder is in said second position; and

a driving mechanism for driving at least one of said reel shafts by utilization of the motive power occurring by said manual operation so as to tighten the winding of said recording medium when said holder moves from said first position to said second position.

4,532,564

REMOVABLE DISK CARTRIDGE

Bert R. Larson, San Jose; Robert P. Wartenbergh, Woodside; Janusz Warszawski, Los Altos; Markus Meier, Carpinteria; David A. Sutton, Santa Ynez; Bin-Lun Ho, Los Gatos, and Efim Bronshvatch, Saratoga, all of Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed Sep. 16, 1981, Ser. No. 302,864

Int. Cl.³ G11B *5/02, 23/02*

U.S. Cl. 360—97 **19 Claims**

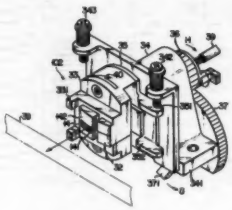
1. In a cartridge including a disk having a central hub, a housing for enclosing said disk, and a releasable disk locking means for maintaining said disk in a secured position when not in use, the improvement comprising relatively rigid lock means normally engaged with said disk hub, blade spring bias means coupled to said lock means for urging said disk hub into said secured position, means for restraining said lock means against lateral motion in said cartridge, and release means for enabling said lock means to be raised away from engagement with said disk hub to thereby release said disk for rotation within said cartridge housing, said lock means comprising a relatively rigid plate member having an inner margin portion normally in contact with said disk hub, and an outer margin normally in contact with said blade spring biasing means;

said release means comprising a relatively stiff pin means secured to said plate member adjacent said outer margin and slidably received in a confinement channel formed in said cartridge housing in a direction generally normal to said plate member, said pin means being snugly received along the axis of said confinement channel to minimize off-axis motion, said pin means and said plate member together forming a lever with a fulcrum at the intersection thereof.

4,532,565
TAPE RECORDER

Seiji Tomita, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 28, 1982, Ser. No. 383,216
Claims priority, application Japan, May 29, 1981, 56-82104
Int. Cl.³ G11B 5/55, 21/00
U.S. Cl. 360—106 6 Claims



1. A tape recorder, comprising:

a head chassis;

a head mount assembly, fixed to said head chassis, having a surface parallel with a plane in which a tape running on said tape recorder would run, and provided with a through-hole about a central portion thereof, said through-hole extending in a direction perpendicular to said surface of said head mount assembly;

a shaft rotatably inserted through the through-hole of the head mount assembly;

head base plate having one surface parallel with the surface of the head mount assembly and the other surface providing a mounting surface, the central portion of the head base plate being fixed to the edge of the shaft such that the head base plate is rotatably together with the shaft in parallel with the surface of the head mount assembly;

a record/play head and an erase head each having a surface which abuts against the tape;

a head support for supporting the record/play head and the erase head, the record/play head being supported such that the tape-abutting surface of the record/play head is exposed to the outer surface of said head support, the erase head being supported at a position outside the record/play head such that the tape-abutting surface of the erase head is exposed to the outer surface of said head support; and

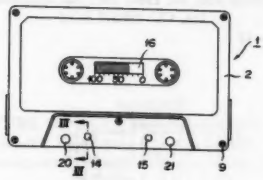
switching means for selectively running the tape at a constant speed in the forward and reverse directions, the shaft rotatably inserted into the through-hole of the head mount assembly being interlocked with the switching means to move the record/play head and erase head to the positions where the tape running in the forward or reverse direction at a constant speed abuts against said heads.

4,532,566
TAPE CASSETTE

Rioichi Horimoto, Komoro, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,774
Claims priority, application Japan, Nov. 16, 1981, 56-170365[U]
Int. Cl.³ G11B 23/02
U.S. Cl. 360—132 8 Claims

1. A tape cassette comprising a cassette body having at least one opening in a surface thereof for accepting insertion of a protuberance formed on a tape recorder with which the cassette is used, said opening being closed with a film readily breakable by the insertion of said protuberance, which film is

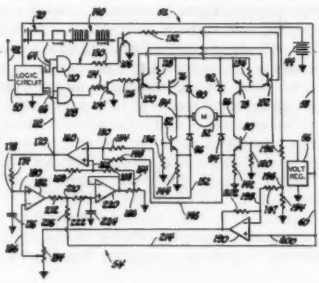


formed monolithically with said cassette body, whereby an unbroken film is indicative of an unused cassette.

4,532,567
ELECTRIC POWER STEERING STALL PROTECTION CIRCUIT

Alexander Kade, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1983, Ser. No. 467,492
Int. Cl.³ H02H 7/00
U.S. Cl. 361—31 3 Claims



1. A motor vehicle power steering system including a motor providing a steering assist force when energized with current, a source of current, and a switch mechanism responsive to a steering force supplied by the operator of the vehicle for energizing the motor with current from the source to provide a seering assist force which aids the operator in overcoming the steering load, the improvement comprising:

limit means effective when the motor current exceeds an upper reference limit for interrupting motor energization until the motor current falls to a lower reference limit determined in relation to the upper reference limit, the upper reference limit being set at a motor current value sufficiently low to protect the motor and switching mechanism during relatively short duration overcurrent conditions while providing adequate steering assist force under normal levels of steering load;

means for monitoring the duty cycle of motor energization interruption effected by said limit means; and

means effective when said monitored duty cycle eaches a value indicative of motor stall for reucing the upper reference limit to a motor current value sufficiently low to protect the motor and switching mechanism during a prolonged period of motor stall caused by excessive levels of steering load.

4,532,568

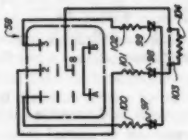
THREE-PHASE LEAKAGE PROTECTION BY ELECTRONIC CONTROL

Arthur A. Kraus, Sr., 471 Scott St., Joliet, Ill. 60432

Filed Jan. 28, 1983, Ser. No. 462,083

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—42 **2 Claims**



1. A monitor unit for an electrical power distribution system which includes isolation transformer means having primary winding means for connection to an AC supply and secondary winding means for connection to wires of a load circuit, said monitor unit comprising a step-down transformer including a primary winding for connection to said AC supply and including a secondary winding having first and second terminals, a silicon-controlled rectifier having cathode and anode electrodes and a gate electrode, means connecting one of said anode and cathode electrodes to said first terminal of said secondary winding, relay means coupled between the other of said anode and cathode electrodes and said second terminal of said secondary winding, resistance means coupled between said gate electrode and said cathode electrode, coupling circuit means for coupling said gate electrode to wires of a load circuit and for coupling said cathode electrode to a ground connection for flow of leakage current through said resistance means, stabilizing means associated with said coupling means and including capacitor means, resistance means connected in series with said capacitor means to form a series circuit, means connecting one terminal of said series circuit to said gate electrode, means connecting the other terminal of said series circuit to said ground connection, diode means for coupling said capacitor means through said diode means to said first and second terminals of said secondary winding to charge said capacitor means and to place said one terminal of said series circuit at a negative potential relative to the other terminal thereof, thereby to provide a negative bias at said gate electrode.

4,532,569

METHOD AND APPARATUS FOR DETECTING IMPROPER POLARITY IN A POWER DISTRIBUTION SYSTEM

Javier F. Salcedo, North Hollywood, Calif., assignor to ABCO Hardware and Builders Supply, Inc., Lynwood, Calif.

Filed Mar. 17, 1983, Ser. No. 476,368

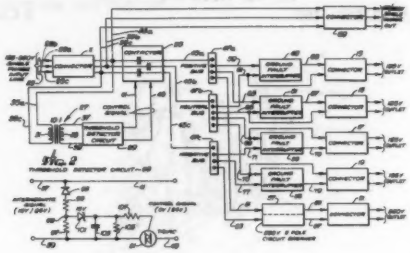
Int. Cl.³ H02H *3/26*

U.S. Cl. 361—76 **12 Claims**

1. Power distribution apparatus for coupling single-phase power from a three-wire input line to a power outlet only if prescribed positive, neutral and negative ac power signals are carried on predetermined wires of the three-wire input line, the apparatus comprising:

fault detection means for detecting the voltage difference between the power signals carried on two predetermined wires of the three-wire input line and for producing a prescribed control signal indicating whenever the detected voltage difference exceeds a prescribed threshold, the fault detection means including transformer means having a primary winding and a secondary winding, the power signals carried on the two predetermined wires of the three-wire input line being coupled to the primary winding and an intermediate signal being produced by the secondary winding, and threshold detector means for comparing the ac voltage of the intermediate signal with a prescribed threshold and producing the control signal in accordance with the outcome of the comparison; and

contactor means for coupling single-phase ac power from



the three-wire input line to the power outlet only when the control signal produced by the fault detection means indicates that the detected voltage difference exceeds the prescribed threshold, whereby power is coupled to the power outlet only when the polarity of the three-wire input line is correct.

4,532,570

RELAY CIRCUIT AND RELAY THEREFOR

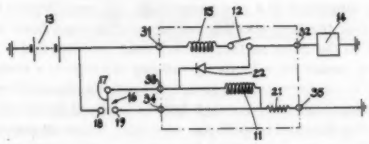
Derek Thornley, and Jack Braithwaite, both of Nelson, England, assignors to Lucas Industries, Birmingham, England

Filed May 19, 1982, Ser. No. 379,927

Claims priority, application United Kingdom, May 22, 1981, 8115786

Int. Cl.³ H02H *3/08*

U.S. Cl. 361—93 **3 Claims**



1. An electromagnetic relay comprising:

a relay winding,

relay contacts for controlling current flow in a load in series with the contacts in use,

urging means for urging the relay contacts to an open condition from which they are closed by energization of the relay winding

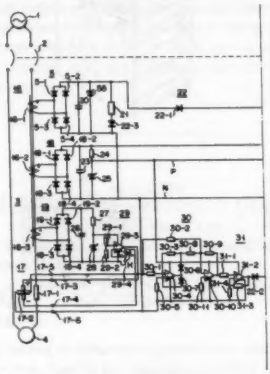
a self-hold, diode means feed connection from the relay contact to the relay winding such that the winding is energised while the relay contacts are closed, and

an overload protection winding connected in series with the relay contacts and wound adjacent said relay winding in opposition thereto, such that when the current flow through said relay contacts and therefore through said overload protection winding exceeds a predetermined value the electromagnetic effect generated by said protection winding opposes that generated by the relay winding to an extent such that said relay contacts can be moved by said urging means to their open condition.

4,532,571
CIRCUIT BREAKER

Kouzou Satou, Mie, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 25, 1983, Ser. No. 545,265
Claims priority, application Japan, Nov. 12, 1982, 57-198602
Int. Cl.³ H02H 3/08
U.S. Cl. 361—93 8 Claims

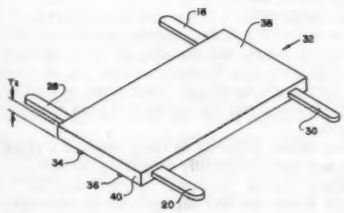


1. A circuit breaker comprising:
an overcurrent tripping device including a first current detector containing a current transformer for detecting a current in a main circuit in a low current region, a second current detector using a Hall element for detecting a current in said main circuit in a larger current region than for said first current detector, and a tripping coil; and
means for supplying the output of said current transformer as a control power source for said overcurrent tripping device, an exciting power source for said tripping coil, and a control current source for said Hall element.

4,532,572
DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Donald P. Schilling, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,468
Int. Cl.³ H01G 1/14, 9/00, 7/00
U.S. Cl. 361—306 16 Claims

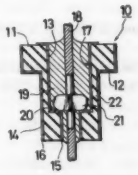


12. A decoupling capacitor including:
a multilayer capacitive element having first and second opposed electrically conductive end surfaces thereon;
a plurality of active terminal pins mechanically and electrically connected to said opposed first and second end surfaces of the capacitive element;
a layer of insulating material molded around said capacitive element, with said active terminal pins projecting therefrom; and
a plurality of stabilizing elements formed as part of said layer of insulating material.

4,532,573
STRUCTURE OF THE FEED-THROUGH CAPACITOR

Yukio Sakamoto, Fukui, and Takeshi Tanabe, Takefu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Dec. 14, 1983, Ser. No. 561,353
Claims priority, application Japan, Dec. 18, 1982, 57-191928
Int. Cl.³ H01G 1/14
U.S. Cl. 361—307 4 Claims

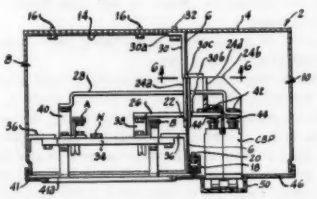


1. A feed-through capacitor comprising:
a tube-shaped dielectric material having a flange portion and an inward projected portion;
the tube-shaped dielectric material having an aperture at the center;
soldering material filled within the aperture;
an inner and an outer electrode covering the inner and the outer surfaces of the tube-shaped dielectric material;
an electrically conductive shaft inserted into the aperture; and
projection means formed on the electrically conductive shaft, the projection rested on the inward projected portion of the tube-shaped dielectric material.

4,532,574
ELECTRIC METER CENTER

Richard A. Reiner, Colgate; John J. Siebenlist, Milwaukee, and Robert J. Clarey, Brookfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 27, 1983, Ser. No. 499,018
Int. Cl.³ H02B 1/20
U.S. Cl. 361—365 15 Claims



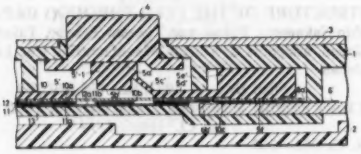
2. The invention defined in claim 1 wherein said first connector means comprises a raised projection.

4,532,575

ELECTRONIC EQUIPMENT HAVING KEY INPUT FUNCTION

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,635
Claims priority, application Japan, Dec. 29, 1981, 56-215327
Int. Cl.³ H05K 1/14
U.S. Cl. 361—413 **10 Claims**



1. Electronic equipment having a key input function comprising:

a first printed circuit board which has electronic components mounted thereon and which has first pattern for connection at an end thereof;

a second printed circuit board which has a first contact for key input on a surface thereof;

electrically connecting means which is flexible and which has a second contact for contacting said first contact of said second printed circuit board, and also has a second pattern for connection with said first pattern of said first printed circuit board;

spacing means, interposed between said second printed circuit board and said electrically connecting means, for separating said second printed circuit board and said electrically connecting means from each other,

operating means, of an elastic material and disposed to contact one surface of said electrically connecting means on the other surface of which said second contact is formed, said operating means having a recess for key inputting at a position corresponding to said second contact, and having an urging portion at a position corresponding to said second pattern; and

clamping means for clamping said first printed circuit board and said urging portion so that the first pattern of said first printed circuit board and the second pattern of said connecting means can contact each other by a compressive recovery force of urging portion of said operating means.

4,532,576

PRINTED WIRING BOARD FILE AND METHOD OF UTILIZING THE SAME

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Aug. 29, 1983, Ser. No. 527,635
Int. Cl.³ H05K 7/14; A47G 29/00
U.S. Cl. 361—415 **7 Claims**

1. A printed wiring board file comprising:

a vertically oriented side plane;

at least one connector affixed to said side plane;

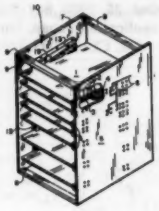
a support plate;

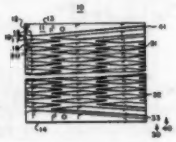
a plurality of positioners positioning said support plane parallel to said side plane;

a printed wiring board guide attached to said support plane and including at least first and second grooves;

at least one printed wiring board, including first and second edges, and a plurality of connector tabs adjacent to said first edge to provide electrical access to said board, said first groove engaged with said board second edge when said support plane is positioned in a first direction relative to said side plane, and said second groove engaged with said board second edge when said support plate is positioned in a second direction relative to said side plane; and

a frangible panel included in said board guide, preventing access of said printed wiring board to said first and second





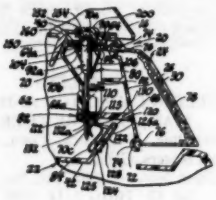
grooves, said panel being removable to permit positioning said board within a selected one of said grooves.

4,532,577

ADJUSTABLE SEATING ARRANGEMENT FOR A TAIL LAMP ASSEMBLY

Allan J. Shelton, Auburn Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1934, Ser. No. 641,846
Int. Cl.³ B60Q 1/44
U.S. Cl. 362—80 **5 Claims**



1. In an automotive vehicle having a tail lamp assembly, said tail lamp assembly comprising:

a rear housing secured to the vehicle and having a top, a bottom a plurality of horizontally spaced sockets for receiving tail lamps, and plurality of horizontally spaced, vertically extending housing portions for receiving fastener means and upper and lower stops on said housing, said top having a slot therethrough at each of said housing portions,

a tail lamp means including an outer lens and a plurality of upper and lower forwardly projecting flanges,

said flanges having vertically aligned apertures therethrough which are also aligned with an adjacent slot in said top,

first spring clips carried by said upper flanges and having apertures aligned with the aperture in said upper flange and having a deflectable depending leg,

second spring clips carried by said housing portions at a location beneath an adjacent lower flange of said tail lamp lens and having a deflectable leg located beneath the aperture in said lower flange,

nut means carried by said lower flanges of said tail lamp means and aligned with the apertures in said lower flanges,

a plurality of headed fasteners each extending through one of the said slots in said top, one of said first spring clips, a housing portion and threadably engaged with one of said nut means,

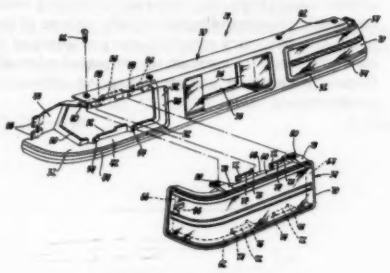
said legs of said first and second spring clips being deflectable by said fasteners and said deflectable legs of said spring clips causing said tail lamp means to be moved toward said housing until upper and lower flanges on said tail lamp means engage said upper and lower stops on said housing when the headed fastener is being secured to said nut means whereby said tail lamp lens is accurately positioned against said housing and aligned with adjacent body surfaces.

4,532,578

VEHICLE BODY LAMP MOUNTING ARRANGEMENT

David W. Gaden, Rochester, and Ted C. Habas, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1984, Ser. No. 577,603
Int. Cl.³ B60Q *1/26*
U.S. Cl. 362—83 3 Claims



3. The combination comprising, a vehicle body finishing panel having spaced upper and generally planar juxtaposed lower walls and a generally planar inboard side wall,

at least one linear retention flange extending laterally to each upper and lower wall at the forward edge thereof,

a lead-in flange extending angularly to each linear flange at the outboard terminus thereof,

a lamp housing having spaced upper and lower walls and an inboard side wall, each respective to a like wall of the opening and an outboard side wall,

at least one linear retention flange on each upper and lower wall of the housing extending toward the outboard side wall of the housing and respective to each finishing panel flange, a lead-in flange extending angularly to each such linear housing flange at the inboard terminus thereof and respective to a finishing panel flange,

the taillamp assembly being moved inboard of the taillamp opening to engage the lead-in flanges of the lamp housing with the respective finishing panel lead-in flanges and guide the respective linear retention flanges into engaged face to face relationship and retain the lamp housing within the lamp opening against movement in a direction outboard thereof, the upper and lower walls and inner wall of the housing being juxtaposed to like walls of the lamp opening and the outboard side wall of the housing closing the open outboard side of the opening, and

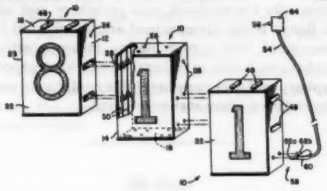
means releasably securing the lamp housing to the finishing panel to retain the lamp housing within the opening against movement outboard of the lamp opening.

4,532,579

ILLUMINATED INTERCONNECTABLE SIGN MODULE

Bill Merryman, 7752 Fians La., Apt. C1, Lanham, Md. 20706

Filed Apr. 13, 1984, Ser. No. 600,018
Int. Cl.³ F21V *11/04*
U.S. Cl. 362—239 20 Claims



1. An illuminable module connectable with one or more substantially similar modules in a linear or non-linear, zigzag arrangement, said module comprising:

an enclosure with at least one surface having a portion capable of transmitting light therethrough;

an illumination source in said enclosure;

at least two electrically-conductive receptacle devices provided on a light non-transmitting surface of said enclosure, said devices being electrically coupled to said illumination source, each of said devices capable of completing an energizing circuit for said illumination source independently of the other device;

an electrically-conductive connector removably received within any one of said receptacle devices to electrically interconnect the illumination source with an adjacent similar module; and

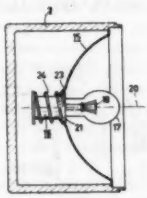
electrical power means connectable to said illumination source through one of said receptacle devices to energize said source, said module connectable with one or more adjacently-disposed similar modules in a linear arrangement by interconnecting with said connector one of said receptacle devices of said module with the corresponding, aligned receptacle device of the adjacent module such that the adjacent module enclosures are linearly arranged horizontally or vertically, or in a non-linear, zigzag arrangement by interconnecting with said connector one of the receptacle devices of adjacent modules such that the adjacent module enclosures are not linearly aligned.

4,532,580

SIGNALLING LIGHT

Willem J. F. Bout, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 324,884, Nov. 25, 1981, abandoned.
This application Mar. 26, 1984, Ser. No. 593,181
Claims priority, application Netherlands, Dec. 22, 1980, 8006948
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—306 2 Claims



1. A signalling light which comprises:

a concave reflector having an axis and an apex, a substantially cylindrical lamp holder disposed substantially at said apex for holding an associated electric lamp in substantially coaxial relation with said axis, means for mounting

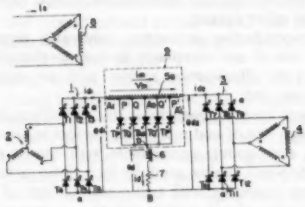
said lamp holder to said reflector which permits rotational movement therebetween to vary the relative angular positions by up to 360 degrees, said means comprising said reflector having near the apex thereof an opening defined by a periphery, said periphery being rotationally symmetrical, said lamp holder having a peripheral flange which is rotationally symmetrical, said periphery and said peripheral flange being dimensioned and configured for mutual engagement, and spring biasing means positioning said periphery and said peripheral flange in engagement, said periphery and said peripheral flange slidingly engaging to allow relative rotational movement.

4,532,581

CIRCUIT FOR REDUCING HARMONICS AND PULSATION IN MULTIPLEX POLYPHASE RECTIFYING CIRCUITS OR INVERTERS, RESPECTIVELY PROVIDED WITH INTERPHASE REACTORS

Shota Miyairi, No. 5-3-10, Kamiuma, Setagaya-ku, Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,679
Claims priority, application Japan, May 19, 1983, 58-86579
Int. Cl.³ H02J *1/02*
U.S. Cl. 363—39 **6 Claims**



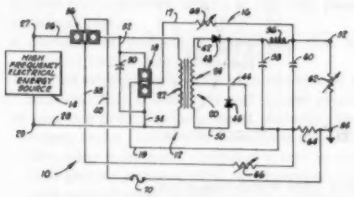
1. A circuit for reducing harmonics in the current on AC side and pulsation in the voltage on DC side in a multiplex polyphase rectifying circuit or an inverter, each having an interphase reactor and plural rectifying circuits, said interphase reactor being provided with a plural number of taps to be respectively connected to a DC circuit via rectifying elements.

4,532,582

VOLTAGE REGULATOR SYSTEM USING MAGNETIC CONTROLLERS

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Power Technology Partners, Ltd., Oklahoma City, Okla.

Filed Feb. 14, 1983, Ser. No. 465,822
Int. Cl.³ H02P *13/12*
U.S. Cl. 363—90 **22 Claims**



1. A voltage regulator system for receiving relatively high frequency electrical energy from a source and providing a regulated relatively low frequency electrical energy output, comprising:

a converter means for receiving the relatively high frequency electrical energy and converting the received relatively high frequency electrical energy and outputting a relatively low frequency electrical energy output;

a passive device sensing means comprising only electrically passive components connected to the converter means for sensing the voltage of the relatively low frequency electrical energy outputted via the converter means and providing output control signals indicative of the sensed output voltage;

a first magnetic controller having current windings and control windings, the current windings of the first magnetic controller being connected in electrical parallel with the converter means and the source of relatively high frequency electrical energy and the control windings of the first magnetic controller receiving one of the control signals from the passive device sensing means; and

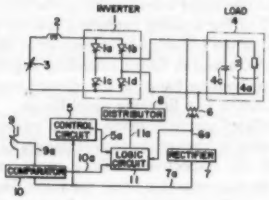
a second magnetic controller having current windings and control windings, the current windings of the second magnetic controller being connected in electrical series between the converter means and the source of relatively high frequency electrical energy and the control windings of the second magnetic controller receiving one of the control signals from the passive device sensing means, the first and the second magnetic controllers receiving the control signals from the passive device sensing means and cooperating to controllingly vary the voltage of the relatively low frequency electrical energy outputted via the converter means to maintain the outputted relatively low frequency electrical energy voltage at substantially a predetermined value.

4,532,583

METHOD AND APPARATUS FOR CONTROLLING AN INVERTER

Yoichi Nemoto, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 20, 1982, Ser. No. 451,421
Claims priority, application Japan, Dec. 24, 1981, 56-208167
Int. Cl.³ H02P *13/20*
U.S. Cl. 363—96 **4 Claims**



1. A method of controlling an inverter of a load commutation type, said inverter having arms each comprising a thyristor, in which pulses are produced and distributed through a distributor to the gates of the thyristors for performing, under normal circumstances, constant margin time control or con-

stant margin angle control of a cyclic voltage applied across a load, said method comprising the steps of:

generating a first pulse in a half cycle of the voltage across a load for performing a constant margin time or constant margin angle control,

detecting the voltage across a load in said half cycle,

comparing the instantaneous magnitude of the detected voltage with a predetermined level,

producing a second control pulse as soon as the instantaneous magnitude of the detected voltage exceeds the predetermined level, and

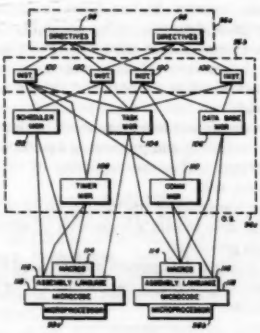
delivering the earlier occurring of the first pulse and the second control pulse in a half cycle of said voltage through the distributor to the gates of the thyristors.

4,532,584

RACE CONTROL SUSPENSION

Anthony M. Federico, West Webster; Ronald A. Ippolito, Rochester, and Ernest L. Legg, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 421,010
Int. Cl.³ G05B *15/02*
U.S. Cl. 364—140 **9 Claims**



1. A machine control, said machine including a plurality of operating components cooperating with one another to produce a result, the control responding to control conditions and executing a plurality of tasks to synchronize the operating components, at least one of the tasks comprising a sequence of steps to be completed, at least one step of the sequence of steps depending upon the occurrence of at least one of a plurality of control conditions, each of the control conditions including an associated response related to the occurrence of said control condition, said control comprising

means to set a list of control conditions related to said one step,

means connected to the means to set a list to monitor said list of control conditions,

means to execute the sequence of steps of said one of the tasks up to said at least one step,

means to monitor the control conditions relating to said at least one step,

means to determine the first occurrence of a control condition related to said at least one step,

means responsive to the means to monitor to execute the response related to the first occurrence of said control conditions related to said at least one step, and

means connected to the means to execute to ignore all other control conditions on said list related to said one step, whereby the operating components are synchronized to produce a result.

4,532,585

Patent Not Issued For This Number

4,532,586

DIGITAL DATA PROCESSING SYSTEM WITH TRIPARTITE DESCRIPTION-BASED ADDRESSING MULTI-LEVEL MICROCODE CONTROL, AND MULTI-LEVEL STACKS

Richard G. Bratt, Wayland, Mass.; Stephen I. Schleimer, Chapel Hill, N.C.; Edward S. Gavrin, Lincoln, Mass.; John F. Pilat, Raleigh, N.C.; Steven J. Wallach, Saratoga, Calif.; Lawrence H. Katz, Oregon City, Oreg.; Douglas M. Wells, Chapel Hill, N.C.; Gerald F. Clancy, Saratoga, Calif.; Craig J. Mundie, Cary, N.C.; David H. Bernstein, Ashland, Mass.; Thomas M. Jones, Chapel Hill, N.C., and Brett L. Bachman, Boston, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,401
Int. Cl.³ G06F *9/22*
U.S. Cl. 364—200 **18 Claims**

1. A digital computer system (CS **101**) including memory means (MEM **112**) for storing operands and instructions denoting certain operands, arithmetic and logic processor means (JP **114**) executing said instructions for performing operations on said certain operands, bus means (MOD **140**, JPD **142**, PD **146**) for conducting said certain operands and said instructions between said memory means and said arithmetic and logic processor means, said arithmetic and logic processor means comprising:

means (Name Translation Unit **27015**) for deriving descriptors further denoting the certain operands from names contained in the instructions, each of said descriptors characterized by a first number specifying a block of data stored in said memory means, a second number specifying an offset from the beginning of said block of data to the start of one of said certain operands contained within said block of data, and a third number specifying the length of said one certain operand;

means (GRF **10354**) for storing the descriptors;

descriptor processor means (DESP **20210**, FIGS. **202** and **270**) for facilitating repetitive operations on related ones of said certain operands by modifying at least portions of said descriptors;

means (ATU **10228**, FIGS. **102** & **270**) for translating the descriptors to memory addresses;

microcode control means for providing sequences of microinstructions controlling said arithmetic and logic processor means in executing said instructions; and

microinstruction stack means comprising one or more stack frames, each capable of storing a state of execution of an interrupted microinstruction, thereby enabling interrupted microinstructions to be resumed without loss of data or processing.

4,532,587

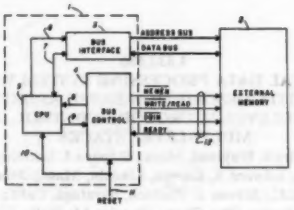
SINGLE CHIP PROCESSOR CONNECTED TO AN EXTERNAL MEMORY CHIP

Derek Roskell, Northants, England; John V. Schabowski, Houston, Tex.; Karl M. Guttag, Houston, Tex., and Kevin C. McDonough, Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1981, Ser. No. 296,283

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **12 Claims**



1. A digital processing system of a plurality of semiconductor substrates comprising:

an external memory means for storing instructions of a first structure, said external memory means fabricated on at least one semiconductor substrate;

a processor unit fabricated on a semiconductor substrate and connected to said external memory means, said processor unit further comprising:

internal memory means for the storage of data of a second structure;

arithmetic and logic means for performing operations on said data;

register means for temporarily storing said data and addresses for accessing said internal and said external memory means;

a first information path of said first structure for connecting said internal memory means, to said arithmetic and logic means via said register means;

a second information path of said second structure for connecting said external memory to said first information path;

multiplexer means for multiplexing said first information path and the second information path to the register means; and

control and timing circuits for the execution of said instructions for accessing the internal memory means, said external memory means and said register means and for controlling said operations on said data by said arithmetic and logic means.

4,532,588

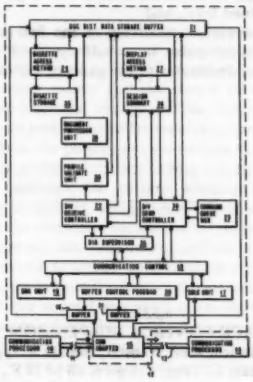
ELECTRONIC DOCUMENT DISTRIBUTION NETWORK WITH UNIFORM DATA STREAM

Gregory J. Foster, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1982, Ser. No. 440,484

Int. Cl.³ G06F *15/16, 15/20*

U.S. Cl. 364—200 **5 Claims**



1. In an electronic document distribution system having a network of communicating data processors and communication linkages between said processors, the improvement wherein

each of the processors has means for receiving and means for transmitting a data stream representative of the content and format of a document and processing to be performed relative to said document,

the network includes higher level processors having a higher level of data processing capability for the data in said data stream and at least one lower level processor having a lower level of data processing capability than said higher level processors for the data in said data stream, and

said at least one lower level processor further includes

means for selecting and processing a portion of a received data stream within the capability of said lower level processor, and

means for transmitting unchanged all of the data in said received data stream irrespective of whether the data has been processed,

whereby a single data stream may be used irrespective of the varying processing capabilities of the processors in the system.

4,532,589

DIGITAL DATA PROCESSOR WITH TWO OPERATION UNITS

Yoichi Shintani, Kokubunji; Kenichi Wada, Zama; Tsuguo Shimizu, Sayama, and Akira Yamaoka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 446,002

Claims priority, application Japan, Dec. 2, 1981, 56-194001; Dec. 2, 1981, 56-194002

Int. Cl.³ G06F *9/38, 9/00*

U.S. Cl. 364—200 **3 Claims**

1. A sata processing apparatus executing a plurality of instructions in a pipeline mode by dividing each of the instructions into a plurality of stages, said apparatus comprising:

means for controlling execution of instructions;

means for sequentially decoding executable instructions to

produce data required for execution of individual instructions;

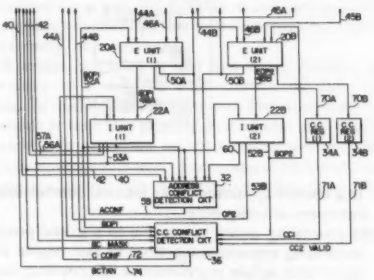
means for storing a queue of data produced as a result of decoding of a plurality of instructions;

first execution means for executing operations required by all of said plural instructions; and

second execution means for executing operations required by part of said plural instructions

wherein said control means includes:

means connected to said storing means for sequentially selecting the data corresponding to a succeeding instruction from said storing means in synchronism with the end of operation of a preceding instruction in said first execution means to supply the selected data to said first execution means;



means connected to said storing means for sequentially selecting the data corresponding to a suceeding instruction from said storing means in synchronism with the end of operation of a preceding instruction in said second execution means to supply the selected data to said second execution means;

means responsive to said decoding means for detecting for each of said instructions whether or not the result of operation of the preceding instruction is to be utilized in a predetermined stage of the succeeding instruction; and

means connected to said detecting means for inhibiting, when the result of detection is affirmative, the execution of the predetermined stage of said succeeding instruction until said first or second execution means completes the operation of said preceding instruction.

4,532,590

DATA PROCESSING SYSTEM HAVING A UNIQUE ADDRESS TRANSLATION UNIT

Steven Wallach, Framingham; Kenneth D. Holberger, N. Grafton; Steven M. Staudaner, Northboro, all of Mass., and Carl Henry, Houston, Tex., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 143,681, Apr. 25, 1980, abandoned. This application Dec. 21, 1982, Ser. No. 451,899

Int. Cl.³ G06F *9/32*

U.S. Cl. 364—200 **16 Claims**

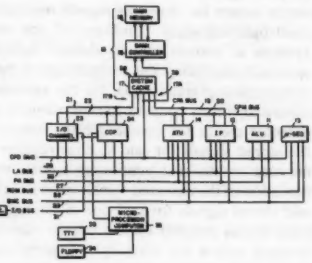
1. In a data processing system which operates in first and second operating modes, said system responding in said first operating mode to first logical addresses containing a first number of address bits and responding in said second operating mode to second logical addresses containing a second number of address bits, said system comprising:

memory means responding to physical addresses containing said second number of address bits;

program counter means for providing logical addresses for accessing a sequence of instruction words a first plurality of said instruction words, during said first operating mode, being accessed from said memory using said first logical addresses and a second plurality of said instruction words, during said second operating mode, being accessed from said memory means using said second logical addresses;

decode means, responsive to instruction words obtained from said memory means, for decoding said instruction words, the decoding thereof producing address descriptor bits, one or more selected ones of said address descriptor bits signifying whether first or second logical addresses are to be used for accessing a subsequent instruction word;

means connected to said decode means and responsive to



said address descriptor bits when said first logical addresses from said program counter means are so signified for converting said first logical addresses into logical addresses containing said second number of address bits; and

means responsive either to said converted logical addresses from said program counter means for translating said converted logical addresses or said second logical addresses into physical addresses containing said second number of address bits for supply to said memory means.

4,532,591

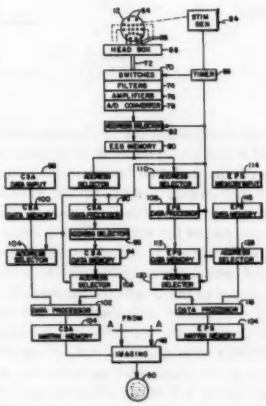
METHOD AND APPARATUS FOR TOMOGRAPHIC DIAGNOSIS

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Aug. 3, 1982, Ser. No. 404,898

Int. Cl.³ G06F *15/42*

U.S. Cl. 364—414 **10 Claims**



1. In a tomographic imaging apparatus comprising X-ray means for scanning a portion of the central nervous system with X-radiation and detecting the X-radiation scanning the central nervous system, processing means for processing de-

tected signals representing the radiodensity of various regions of the scanned body from the X-ray means and imaging means coupled to the processing means for generating an image representing the radiodensity of various regions of the central nervous system, the improvement comprising:

memory means for storing and generating signals representing a predetermined electrophysiological condition of the central nervous system at various regions thereof including the spectrum of components in an electroencephalographic signal;

detector means for detecting signals representing the actual electrophysiological condition of the central nervous systems at various regions thereof including means for spectrally analyzing the components of the detected electroencephalographic signal for the various regions;

comparison means coupled to said memory means and said detector means for comparing the detected signals with the stored signals for said various regions of said central nervous system and generating signals representing the deviation of the detected signals in one of the regions from said stored signals for said one of the regions; and

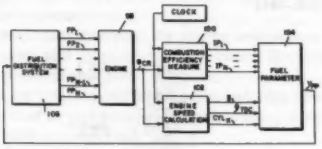
display means coupled to said comparison means and said imaging means for visually indicating said one of the regions representing said deviation on said image.

4,532,592

ENGINE-PERFORMANCE MONITOR AND CONTROL SYSTEM

Stephen J. Citron, and William P. Mihelc, both of West Lafayette, Ind., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed Dec. 22, 1982, Ser. No. 452,372
Int. Cl.³ F02P 9/00; G01M 15/00
U.S. Cl. 364—431.05 **10 Claims**



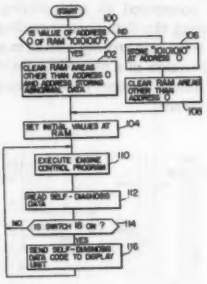
3. A system for controlling the performances of the individual cylinders of a multiple cylinder internal combustion engine comprising an engine fuel distribution system, means for coupling the fuel distribution system to the various cylinders, means for sensing engine crankshaft position, a clock for generating a time base, means for sensing the top dead center point of the power stroke in each cylinder, means for calculating crankshaft speed, means for coupling the clock and the crankshaft position sensor to the crankshaft speed calculator, means for calculating combustion efficiencies of the various cylinders, means for coupling the combustion efficiency calculating means to the means for sensing the top dead center point, to the means for sensing the crankshaft position and to the clock, means for calculating a fuel distribution parameter for the various cylinders to control the performance of the various cylinders, means for coupling the combustion efficiency calculator means to the means for calculating the fuel distribution parameter and means for coupling the fuel distribution parameter calculation means to the engine fuel distribution system.

4,532,593

ELECTRONIC CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yasunori Mouri; Osamu Abe, and Akira Teragakiuchi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,161
Claims priority, application Japan, May 13, 1981, 56-70804
Int. Cl.³ F02D 35/00; G11C 29/00; G01M 15/00
U.S. Cl. 364—431.11 **2 Claims**



1. In a control apparatus for an internal combustion engine, the improvement comprising:

data processing means responsive to a stored program for controlling respective functions of said engine in accordance with signals representative of operating conditions of said engine, including volatile memory means for storing specific data relating to the operation of the engine; and

power supply means for supplying operating voltage to said data processing means, including a constant voltage circuit in series with a key switch for connecting a voltage supply to said volatile memory and means for connecting said volatile memory directly to said voltage supply;

said data processing means including means for reading out the contents of a specific address of said volatile memory means immediately after said key switch has been closed, for determining whether or not the read-out contents indicate a predetermined specific code, for causing storage of the predetermined specific code into said specific address of said volatile memory means when said read-out contents do not indicate said predetermined specific code and for clearing areas of said volatile memory means other than said specific address and selected addresses when said read-out contents indicate said predetermined specific code.

4,532,594

MULTIPLE MICROCOMPUTER SYSTEM WITH COMONITORING/BACK-UP FOR AN AUTOMOTIVE VEHICLE

Akio Hosaka; Akito Yamamoto, both of Yokohama, and Katsunori Oshiage, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 9, 1982, Ser. No. 396,658
Claims priority, application Japan, Jul. 13, 1981, 56-108091
Int. Cl.³ G05B 9/02; F02D 28/00; G06F 11/20
U.S. Cl. 364—431.11 **8 Claims**

1. An electronic data processing system mounted in an automotive vehicle, comprising:

(a) a first microcomputer for performing engine control functions including primary control over primary engine functions including fuel injection start and duration, ignition timing, and fuel pump energization, and secondary control over secondary engine functions;

(b) a second microcomputer for performing display control functions including primary control over primary indica-

tions including speedometer and odometer indications and secondary control over secondary vehicle driving indications;

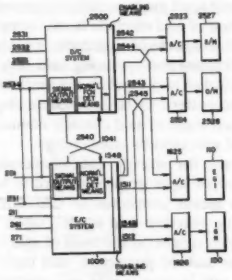
(c) first means provided within said first microcomputer for outputting to the second microcomputer a first signal for indicating whether said first microcomputer is operating properly;

(d) second means provided in said second microcomputer for outputting to the first microcomputer a second signal indicating whether said second microcomputer is operating properly;

(e) third means, provided in said first microcomputer and responsive to said second signal from said second means, for determining whether said second microcomputer is functioning properly;

(f) fourth means, provided in said second microcomputer and responsive to said first signal from said first means, for determining whether said first microcomputer is functioning properly;

(g) fifth means, provided in said first microcomputer and responsive to a negative determination by said third means, for enabling and causing said first microcomputer to assume at least said primary control over said primary indications from second microcomputer, with said first microcomputer additionally continuing to perform at least its primary control over primary engine functions; and



(h) sixth means, provided in said second microcomputer and responsive to a negative determination by said fourth means, for enabling and causing said second microcomputer to assume at least said primary control over said primary engine functions from said first microcomputer, with said second microcomputer additionally continuing to perform at least its primary control over said primary indications.

5. A method of operating an electronic control system for an automotive vehicle having two microcomputers respectively performing different vehicle control and monitoring functions, comprising the steps of:

(a) outputting, directly from each microcomputer to the other microcomputer, a monitor signal indicative of whether the outputting microcomputer is malfunctioning;

(b) monitoring the monitor signal outputted by each of said microcomputers with the other microcomputer, each of said microcomputers being operable to recognize whenever the other microcomputer is malfunctioning;

(c) performing at least some functions of a malfunctioning one of said microcomputers with the other of said microcomputers whenever said one of said microcomputers is malfunctioning; and

(d) executing steps (a) and (b) with both microcomputers concurrently.

4,532,595

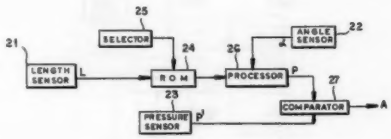
LOAD-MONITORING SYSTEM FOR BOOM-TYPE CRANE

Wolfgang Wilhelm, Ratingen-Hösel, Fed. Rep. of Germany, assignor to Krüger GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,246

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—463 **4 Claims**



1. A load-monitoring system for use aboard a crane having an extendable boom inclinable at different angles to the horizontal, comprising:

first sensing means for generating a first signal representative of the effective length of said boom;

second sensing means for generating a second signal representative of the elevational angle of said boom;

memory means storing a plurality of sets of coefficients of polynomials of at least the fifth order closely approximating respective curves giving the maximum permissible load for different boom lengths as a function of a variable parameter related to boom inclination, said memory means being addressable by said first sensing means for reading out a set of coefficients selected in response to said first signal;

processing means connected to said memory means and to said second sensing means for calculating a numerical value of the polynomial defined by the selected set of coefficients which corresponds to said variable parameter as determined by said second signal;

measuring means engageable with said boom for determining the magnitude of a load supported thereby; and

comparison means with inputs connected to said processing means and to said measuring means for generating an alarm signal upon said magnitude exceeding a permissible limit determined by said numerical value.

4,532,596

CONTROLLING REGISTER IN A PRINTING PRESS

Peter C. Pugsley, Pinner, United Kingdom, assignor to Crosfield Electronics Limited, London, England

Filed Oct. 27, 1982, Ser. No. 437,049

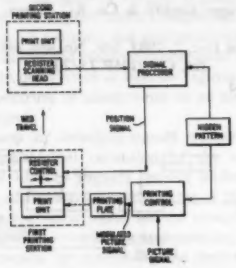
Claims priority, application United Kingdom, Oct. 30, 1981, 8132809

Int. Cl.³ B65H *23/04*

U.S. Cl. 364—469 **6 Claims**

1. A method of controlling the register of a printing operation with at least another operation performed on a web at respective stations, comprising the steps of: providing picture signals corresponding to an image to be reproduced on which is superimposed a hidden, irregular pattern (REPEAT CELL, FIG. 1) which is repeated many times over the image area; printing the web from a printing member produced under the control of the picture signal; monitoring (A, B; FIG. 13) the relative positions of the printed image on the web and the other operation performed on the web by detecting light derived from a portion (P, FIG. 1) of the printed image on the web surface, and correlating (FIGS. 1A, 2) the variations of light intensity within that portion with the variations of regions of the predetermined pattern, and thus deriving a position signal

indicative of the displacement of the web from a reference position established by the position of the detector; and main-



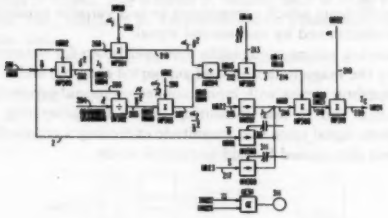
taining the correct register of the operations by making adjustments at a station in accordance with the position signal.

4,532,597

DIGITAL INERTIA COMPENSATION GENERATOR AND REEL MOTOR DRIVE SYSTEM EMBODYING THE SAME

Mohammed Safiuddin, Williamsville, and Bhupendra S. Surana, East Amherst, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1982, Ser. No. 401,426
Int. Cl.³ G06G *7/26;* B65H *59/38*
U.S. Cl. 364—471 **3 Claims**



1. In a line for processing a strip of material moving from a pay-off to a winding reel, each reel being driven by a direct current motor drive system at controllable speeds, with strip material being accumulated at speeds on such reel to a diameter D; and said direct current motor drive system being controlled in relation to a current reference control signal; with said direct current motor drive system further including means for deriving a normalized signal $\overline{D}$ from said diameter D; means for deriving a normalized signal $\overline{S}$ from said speed S and means for deriving a normalized signal $\Delta\overline{S}/\Delta t$ from said speed S; and a programmable controller comprising:

means responsive to said $\overline{D}$ signal and to said $\Delta\overline{S}/\Delta t$ signal for deriving a normalized representation $\overline{J}$ of the moment of inertia J of said reel in accordance with the formula

$$J=(\alpha_1 \cdot D^2+\alpha_2/D^2)\Delta S/\Delta t;$$

means responsive to said $\overline{D}$ signal and to said $\overline{J}$ signal for deriving a signal representative of the product $\overline{J}\times\overline{D}$; and

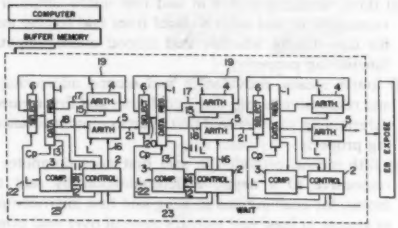
means for outputting a signal representative of said $\overline{J}\times\overline{D}$ product as a representation of said current reference control signal.

4,532,598

ELECTRON BEAM EXPOSURE SYSTEM

Akinori Shibayama, Tokyo; Minpai Fujinami, Iruma, and Haruo Yoda, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,301
Claims priority, application Japan, Jun. 10, 1981, 56-88183
Int. Cl.³ G01K *1/08;* H01J *3/14, 3/26*
U.S. Cl. 364—491 **13 Claims**



1. An electron beam exposure system in which an electron beam having a rectangular shaped cross-section of a selectively adjustable size is formed in accordance with data for a graphic pattern to be exposed and a pattern corresponding to said rectangular shaped cross-section is exposed through each single irradiation of said electron beam, comprising a plurality of unit circuits connected in cascade as a plurality of pipelined stages, and means for operating said unit circuits in parallel with one another in a pipeline manner, whereby the data for said graphic pattern to be exposed in sequentially delivered from the final stage of said cascade connection,

each of said unit circuits comprising:

storage means for storing data concerning shape, size and position of an input graphic pattern to be exposed;

comparison means connected to said storage means for discriminating whether said input graphic pattern should be decomposed or not on the basis of said data concerning the shape, size and the position of said input graphic pattern as stored in said storage means and predetermined parameters relating to the processing to be performed by each unit circuit; and

arithmetic operation means responsive to said comparison means for decomposing said input graphic pattern into two sub-patterns when said comparison means indicates that said input graphic pattern is to be decomposed, deriving data relating to the shape, size and position for each of said two sub-patterns, outputting the data for one of said sub-patterns and reloading the data for the other sub-pattern into said storage means.

4,532,599

QUALITY CONTROL METHOD

Stanley K. Smith, Fenton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 12, 1982, Ser. No. 407,398
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—552 **11 Claims**

1. A method of removing material from a workpiece while monitoring the quality of the workpiece including the steps of:

supporting a workpiece,

supporting a cutting tool in a position in which it is adapted to engage with and cut said workpiece,

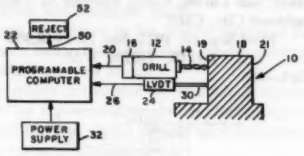
moving said cutting tool and workpiece relative to each other through a cycle to enable said cutting tool to remove material from said workpiece,

dividing each cycle of said cutting tool and workpiece into a plurality of increments,

sensing the force exerted between said tool and workpiece during each of said increments of said cycle,

setting force limits for different increments of said cycle,

comparing said sensed force exerted between said tool and workpiece with said set force limits, and



generating a first signal indicative of a workpiece of unacceptable quality if said sensed force is not within said set force limits.

4,532,600

ELECTRONIC INTEGRATING METER

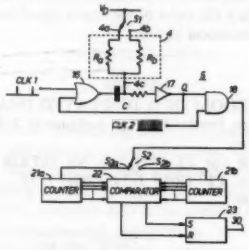
Yuji Mihara, Yokohama, and Ryoji Gamo, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 12, 1982, Ser. No. 367,788

Claims priority, application Japan, Apr. 13, 1981, 56-55448; Oct. 7, 1981, 56-159698

Int. Cl.³ G01P *3/42*

U.S. Cl. 364—565 **10 Claims**



1. An electronic integrating meter comprising:

a. a rotatable body;

b. a magnet attached to said body to rotate therewith;

c. a magneto-resistive element having at least first and second resistances, the values of which vary in response to rotation of said magnet;

d. a means for developing first clock pulses;

e. circuit means, coupled to said resistances and having first and second time constants which vary as a function of said first and second resistances, respectively, for developing first and second pulses at predetermined time intervals which each include a variable number of said first clock pulses in the form of a pulse train, each of said variable numbers of said first clock pulses being representative of a respective one of said first and second time constants during a selected one of said predetermined time intervals;

f. means for determining which of successive first and second pulses has the greater number of said first clock pulses; and

g. means, responsive to said means for determining, for indicating the occurrence of a revolution of said body.

4,532,601

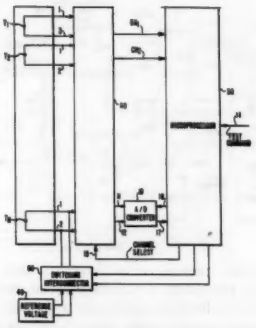
AUTOMATIC TEMPERATURE CALIBRATION METHOD AND APPARATUS

Bruce N. Lenderking, Glen Burnie, Md., and Robert D. Couch, New Freedom, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 19, 1982, Ser. No. 409,688

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—571 **6 Claims**



1. In a multiplexed analog data acquisition system, for deriving on respective channel outputs signals representative of analog data at a plurality of respective measuring points with the assist of a reference source common to a group of such measuring points, the combination of:

a microprocessor common to said group of measuring points;

switching means controlled by said microprocessor in a first calibration mode for short-circuiting the input of a selected one of the output channels of said group, said microprocessor in said first calibration mode being responsive to said selected input to derive an offset error therefrom;

said microprocessor controlling said switching means in a second calibration mode for switching said reference source at the input of said selected output channel, said microprocessor in said second calibration mode being responsive to said selected input to derive a reference output voltage therefrom;

said microprocessor providing with said offset error and said reference output voltage an indication of the gain through said channel;

said microprocessor controlling said switching means in a measurement mode to provide in relation to said selected channel an output signal representative of the derived analog data; and

said microprocessor providing with said offset error and said gain indication, a calibrated representation of said analog data in relation to said representative output signal.

4,532,602

DEVICE FOR ELECTRICAL VARIABLE MAGNIFICATION OF DOCUMENT IMAGE

Dale R. DuVall, Keller, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,807

Int. Cl.³ G06G *7/30*; G06F *15/40*

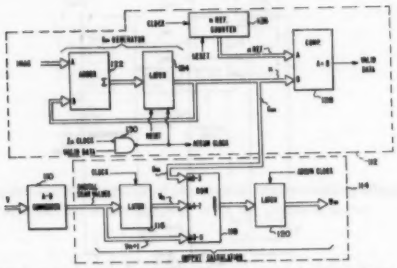
U.S. Cl. 364—577 **12 Claims**

1. A system for altering the size of an image by a desired magnification after optical scanning thereof by providing a plurality of output scan values different in number from the number of sampled scan signals produced during optical scanning, said output scan values being representative of the density of the image at pixel locations spaced across the image in

dependence upon a selected magnification value, said system comprising:

scanning means for providing a sequence of sampled scan signals, each such sampled scan signal being representative of the image density at an associated pixel location in a row of pixel locations across said image,

converter means for converting said sampled scan signals to a corresponding sequence of digital scan values,



control circuit means, responsive to said magnification value, for providing a plurality of interpolation control values in synchronism with said sequence of digital scan values, said interpolation control values indicating the spatial relationship of output scan values with respect to pairs of successive digital scan values, and

interpolation means, responsive to said sequence of digital scan values and to said interpolation control values, for interpolating between pairs of said digital scan values to provide said output scan values.

4,532,603

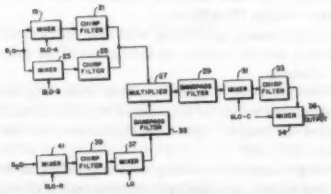
CHIRP TRANSFORM CORRELATOR

Henry M. Gerard, Capistrano Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1983, Ser. No. 473,467

Int. Cl.³ G06G 7/19

U.S. Cl. 364—819 **11 Claims**



1. An asynchronous chirp transform correlator, comprising, first circuit means to obtain the Fourier transform of an unknown signal S1, and a second circuit means to obtain the complex conjugate of the Fourier transform of a reference signal S2, third circuit means including a multiplier to which said Fourier transform of signal S1 and said complex conjugate of the Fourier transform of signal S2 are applied to obtain the product thereof, and further circuit means connected to the output of said multiplier to obtain the inverse Fourier transform of said product and provide an output which is the cross-correlation between said signals, and wherein said first circuit means includes a pair of channels each having a mixer and respective first input connection to receive said signal S1, a sweeping local oscillator connected to a respective second input of each said mixer and chirp filter means connected to the output of each said mixer, said sweeping local oscillators both being linearly swept in frequency over the same bandwidth but being interlaced or staggered in timing so that any randomly timed signal S1 of less than a given duration will be completely transformed on one or the other of said channels

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4,532,604

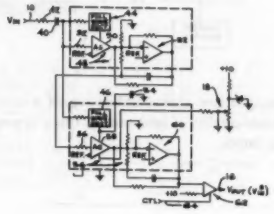
PREDISTORTION CIRCUIT

Jay S. Baker, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,904

Int. Cl.³ H02M 5/16

U.S. Cl. 364—851 **11 Claims**



1. A circuit for generating a predistortion signal from an input signal of given sign, comprising:

rectifier means for generating the absolute value of the input signal;

first operational transconductance amplifier means receiving the input signal of given sign and responsive to the absolute value for generating the square of the input signal times the sign of the input signal; and

second operational transconductance amplifer means coupled to the first operational transconductance amplifier means and responsive a second time to the absolute value for generating the cube of the input signal corresponding to the predistortion signal.

4,532,605

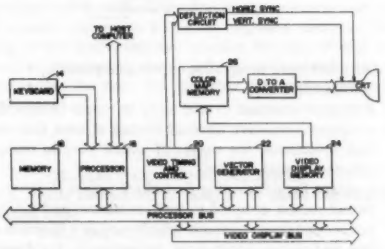
TRUE ZOOM OF A DISPLAYED IMAGE

William G. Waller, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 12, 1982, Ser. No. 367,829

Int. Cl.³ G06F 3/14; G09G 1/16

U.S. Cl. 364—900 **4 Claims**



1. A graphics display terminal capable of performing a zoom operation on a displayed image to produce a resultant zoomed image, said terminal being responsive to instructions from a main memory source for producing said resultant zoomed image, an improvement comprising:

input means for introducing information into said graphics display terminal related to said zoom operation;

first means for processing said instructions from said main memory source and said information introduced via said

input means including: a means for designating a portion of the displayed image that is to be subjected to the zoom operation in response to said information, and a means for implementing the zoom operation on the designated portion to produce a representation of a resultant zoomed image with the lines which define the resultant zoomed image being approximately equal to the width of the l...es which define said displayed image;

second means responsive to the representation of the resultant zoomed image for producing a pixel representation of said resultant zoomed image;

converting means responsive to said pixel representation produced by the second means for converting said pixel representation into video signals representative of said resultant zoomed image; and

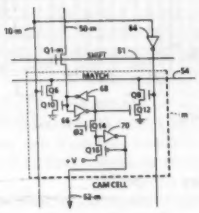
display means responsive to said video signals for displaying said resultant zoomed image.

4,532,606

CONTENT ADDRESSABLE MEMORY CELL WITH SHIFT CAPABILITY

Andrew E. Phelps, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jul. 14, 1983, Ser. No. 513,393
Int. Cl.³ G11C *15/04*
U.S. Cl. 365—49 **6 Claims**



1. A memory cell for storing data provided on a load data input terminal and being adapted for comparing data supplied on a compare data input terminal with data stored in said cell and for supplying an output signal on a match data output terminal when the compare data is the same as the data stored in the cell, said memory cell comprising:

a. a latch circuit for storing data and having a true output terminal coupled to said load data input terminal and a not true output terminal;

b. first means coupled between said match data output terminal and a reference potential and being disposed for applying the reference potential to said match data output terminal in response to a comparison of the state of said latch circuit and the compare data;

c. second means coupled between said match data output terminal and said reference potential and being disposed for applying the reference potential to said match data output terminal in response to a comparison of the inverse state of said latch circuit and the inverse of the compare data;

d. said latch circuit further comprising a pair of inverters each of which has an output coupled to the input of the other inverter and wherein one of said inverters is scaled smaller than the other so that the state of said latch circuit is modifiable by changing the state of the true output terminal of said latch circuit; and

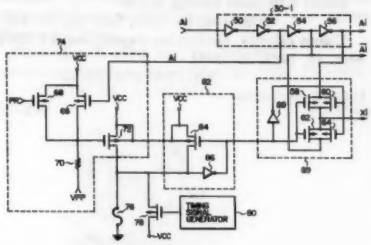
e. a transistor means serially coupled to said load data input terminal and being responsive to a shift signal when loading data into said memory cell.

4,532,607

PROGRAMMABLE CIRCUIT INCLUDING A LATCH TO STORE A FUSE'S STATE

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 16, 1982, Ser. No. 398,925
Claims priority, application Japan, Jul. 22, 1981, 56-114701; Dec. 25, 1981, 56-209364
Int. Cl.³ G11C *11/34, 17/00*
U.S. Cl. 365—96 **12 Claims**



1. A programmable circuit comprising:

fuse means set at a first potential at one end, which is blown according to address data to be programmed;

potential setting means for supplying a pulse signal of a second potential to the other end of said fuse means; and

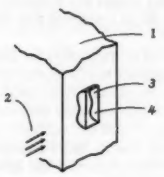
feedback type latch means responsive to said pulse signal for latching a voltage across said fuse means to provide a read-out of said address data.

4,532,608

MEMORY DEVICE

Jiun-Tsong Wu, 446 Manzanita Ave., Sierra Madre, Calif. 91024

Filed Jun. 25, 1982, Ser. No. 392,147
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—127 **20 Claims**



1. In a memory system including a storage medium, a read device, and a write device; said memory system characterized in that light is used to transmit signals, the improvement in which said storage medium comprises a light transparent substrate with a plurality of cells in it, each of said cells having an empty space and having a preselected amount of ablative material deposited on a wall of said sapce at a preselected area within the cell along with a clear area for representing coded data in accordance with the relative locations of the areas covered by the ablative material and the clear area, and said ablative material is opaque to said light and vaporizable by a high intensity light beam to cause the ablative material to be redeposited on another location within the cell to thereby form a clear area thereat and to change the relative locations of the areas covered by the ablative material and the clear areas for representing different coded data, and wherein the read device of the memory system has a light sensor and means to direct a beam of light towards a selected cell in order to detect the

relative locations of said ablative material covered areas and the clear area in said cell, and that the write device of the system has means to direct a beam of high intensity light towards a selected cell in order to change the relative locations of said ablative material in said cell by vaporizing said ablative material and causing the material to be redeposited at another area and defining another clear area at the vaporized area.

4,532,609

SEMICONDUCTOR MEMORY DEVICE

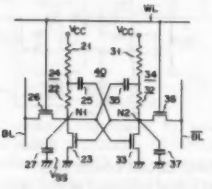
Tetsuya Iizuka, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 14, 1983, Ser. No. 504,125

Claims priority, application Japan, Jun. 15, 1982, 57-102835; Mar. 10, 1983, 58-39551

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—154 **10 Claims**



1. A semiconductor memory device comprising:

a first MOS transistor and a first load resistor connected in series between a power source voltage and a reference voltage;

a second MOS transistor and a second load resistor connected in series between the power source voltage and the reference voltage;

a third resistor whose one end is connected to an output node of said first MOS transistor;

a fourth resistor whose one end is connected to an output node of said second MOS transistor;

first connecting means for interconnecting the output node of said first MOS transistor and the gate of said second MOS transistor;

second connecting means for interconnecting the output node of said second MOS transistor and the gate of said first MOS transistor; and

third and fourth MOS transistors for data transfer in which said third MOS transistor is connected between a first bit line and the output node of said first MOS transistor, said fourth MOS transistor is connected between a second bit line and the output node of said second MOS transistor, and the gates of said third and fourth MOS transistors are connected to a common word line; wherein the following relations hold

$$\frac{C2}{C1} < 2\frac{Vo - V_{TN}}{V_{TN}}$$

$$\ln\left\{\frac{1}{\left(1+\frac{C2}{2C1}\right)\frac{V_{TN}}{Vo}}\right\} > \frac{t_d}{C1R2}$$

$$C1R2 < t_w$$

wherein

R2: resistance of each of said third and fourth resistors,

C1: capacitance on said gate electrode node,

C2: capacitance on the output electrode node of each of said first and second MOS transistors,

Vo: high level potential on the output electrode node of said first and second MOS transistors,

V_{TN}: minimum value of a potential difference appearing between the output nodes of said first and second MOS transistors, with said potential difference the logical "1", "0" states of the output electrode nodes N1 and N2 can return to the steady state;

t_d: time until the electric current pulse generated due to the incidence of the high energy particles disappears; and

t_w: minimum value of the pulse width of a write designating signal.

4,532,610

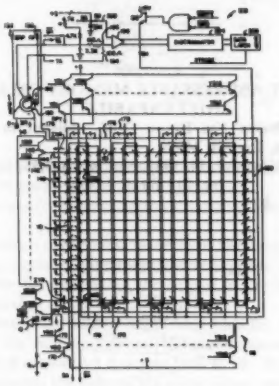
LOW NOISE CORE MEMORY SENSE WINDING

Thomas J. Gilligan, Rolling Hills Estates, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jul. 16, 1981, Ser. No. 284,092

Int. Cl.³ G11C *7/02, 11/061*

U.S. Cl. 365—130 **13 Claims**



8. A core memory comprising:

a rectangular array of magnetic memory cores arranged in rows and columns;

a plurality of X drive conductors, each inductively coupling all of the cores in a different row;

a plurality of Y drive conductors, each inductively coupling all of the cores in a different column; and

a sense conductor magnetically coupling all of the cores in the array, the sense conductor being arranged to sequentially couple each core in every column in a direction parallel to the Y conductors and having no crossovers to another column within the array, the relative direction of the sense conductors and the relative core orientations being selected in conjunction with one another to attain a unipolar output of selected core output switching signals on the sense conductor, the sense conductor further being arranged in conjunction with the X and Y drive conductors to attain cancellation of substantially all of the noise induced in the sense conductor by the inductive coupling of partially selected cores during a read part cycle.

4,532,611

REDUNDANT MEMORY CIRCUIT

Roger S. Countryman, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1982, Ser. No. 438,081

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—200 **6 Claims**

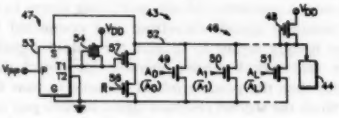
1. A circuit for replacing a defective line of memory cells with a redudant line of memory cells, comprising:

a first NOR decoder comprised of IGFETS having an output for providing an enable signal to the defective line

memory cells in response to a predetermined combination of true and complementary address signals;

disabling means, coupled to the output of the first NOR decoder, for disabling the defective line of memory cells, in response to contemporaneously receiving an implementation signal and the enable signal, by preventing the subsequent occurrence of the enable signal;

a second NOR decoder, coupled to the redundant line of memory cells, comprised of IGFETs, and having inputs for the true and for the complementary address signals; and



a plurality of fusible links for disabling all of the inputs which are for the true and complementary address signals which are complementary to the predetermined combination in response to the comtemporaneous occurrence of the predetermined combination and the implementation signal;

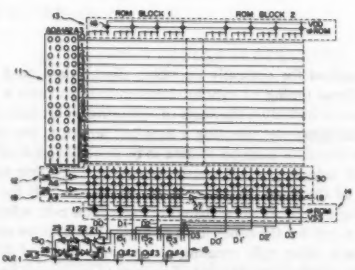
whereby the second NOR decoder provides an output signal to the redundant line of memory cells in response to receiving the predetermined combination if the inputs of the second NOR decoder which are for the true and complementary address signals which are complementary to the predetermined combination have been disabled.

4,532,612

DYNAMIC READ ONLY MEMORY

Fuminari Tanaka, and Yoshihiro Iwamoto, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 15, 1982, Ser. No. 450,049
Claims priority, application Japan, Dec. 16, 1981, 56-202802
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—227 **3 Claims**



1. A dynamic read only memory comprising:

a plurality of memory cells connected to column lines and arranged in a matrix fashion in a plurality of blocks;

an address decoder coupled to said plurality of memory cell blocks for decoding an address signal designating one of said memory cells in one of said plurality of blocks;

means, coupled to said plurality of memory cell blocks, for reading out data from a selected column line to which said designated memory cell is connected and for latching said data;

control means, coupled to said plurality of memory cell blocks, for outputting to said reading means said data from said memory cell block containing said designated memory cell; and

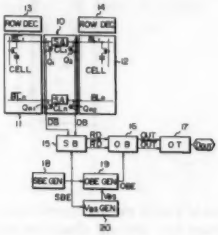
means, coupled to said control means, for discharging the outputs from said memory cell blocks not containing said designated memory cell and for maintaining said discharged outputs at a predetermined discharge potential level.

4,532,613

SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Yokohama; Tomio Nakano, Kawasaki, and Tsuyoshi Ohira, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 9, 1982, Ser. No. 356,487
Claims priority, application Japan, Mar. 13, 1981, 56-36945
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—230 **7 Claims**



1. A semiconductor memory device having a memory cell producing data signals, comprising:

an output buffer circuit receiving the data signals read out from the memory cell and producing output signals, and having an output stage;

an output stage MOS transistor, operatively connected to the output stage of said output buffer circuit, being turned ON and OFF according to the output signals of said output buffer circuit;

an output buffer enable signal generator circuit, operatively connected to the output stage of said output buffer circuit, for generating an output buffer enable signal which is used as a voltage supply to the output stage of said output buffer circuit having a voltage source operatively connected thereto and an output stage transistor operatively connected to said output buffer circuit; and

a voltage generator circuit, operatively connected to the output stage transistor of said output buffer enable signal generator circuit, for generating a boosting voltage higher than the voltage source preceding the rising up of said output buffer enable signal, said boosting voltage being fed as a voltage supply to the output stage transistor of said output buffer enable signal generator circuit, said output buffer enable signal being formed as a voltage waveform which rises up to a level higher than the voltage source.

4,532,614

WALL BORE ELECTRICAL GENERATOR

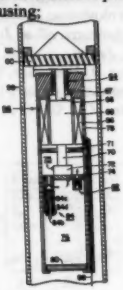
James M. Peppers, P.O. Box 13278, 1026 Plover La., Arlington, Tex. 76013

Filed Jun. 1, 1981, Ser. No. 269,427
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—81 **12 Claims**

8. An impeller driven electrical power generator in combination with a rotary liquid seal protection means adapted to be actuated by the flow of drilling mud through a drill string, comprising:

(a) a sealed housing defining a first chamber separated from a second chamber;

(b) said chambers being filled with a sealing liquid;
(c) a rotatable shaft extending from outside said housing into said first chamber through a rotary seal means connected to establish a liquid seal between said housing and said shaft;
(d) said electrical power generator means being mounted within said housing and connected to be rotatably driven by said shaft;
(e) pressure equaliziang means for maintaining the fluid pressure of said sealing liquid within said housing and said chambers to be equal to the fluid pressure of the drilling mud outside said housing;



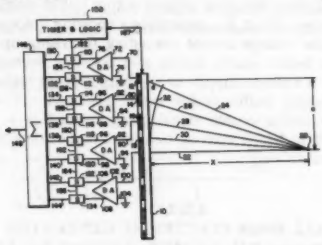
(f) a rotatable pump means connected to pump said sealing liquid from said second chamber into said first chamber when rotated by said shaft;
(g) a selectively biased liquid pressure regulating means connected to regulate a return flow of sealing liquid from said first chamber into said second chamber and to control the fluid pressure of the sealing liquid applied to said rotary seal means from within said first chamber to be greater than the fluid pressure of the drilling mud applied to said rotary seal means from outside said housing; and
(h) an impeller means mounted to said shaft exterior of said housing and adapted to rotate said shaft when rotated by the flow of said drilling mud past said housing.

4,532,615

PHASED ARRAY FOR AN ULTRASONIC TRANSDUCER

Dale O. Ballinger, Lakewood, Colo., assignor to Biosound, Inc., Indianapolis, Ind.

Filed Sep. 28, 1982, Ser. No. 425,805
Int. Cl.³ G01S 7/52, 15/02
U.S. Cl. 367—87 **22 Claims**



1. Apparatus for use with a transducer having first and second portions each of which produce an electrical signal that varies on opposite sides of a reference potential upon receipt of a signal from a remote object, the first and second portions receiving a signal from the remote object at times which differ by an amount dependent on the distance to the remote object with the result that at certain distances from the remote object, the electrical signal from the first portion may be predominantly on the opposite side of the reference potential from the electrical signal from the second portion, comprising:

modifying means connected to the first and second portions to receive the electrical signals thereform, said modifying means operable to produce first and second pairs of resultant signals which vary with the electrical signals from said first and second portions, respectively, each of which pairs of resultant signals includes first and second resultant signals varying in opposite sense to each other;

range finding means for determining the distance to the remote object and producing an output signal when the object is nearer than a predetermined distance; and

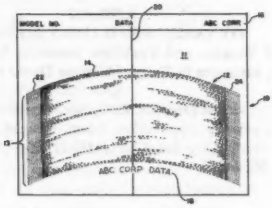
switch means connected to said modifying means to receive the resultant signals therefrom and connected to said range finding means to receive the output signal therefrom, said switch means operable for object distances greater than the predetermined distance to pass the first and block the second resultant signal of each pair of resultant signals and upon receipt of an output signal from said range finding means to pass the second and block the first of the resultant signals in the first resultant signal pair and to pass the first and block the second of the resultant signals in the second resultant signal pair.

4,532,616

METHOD FOR OPTICALLY ENCODING DIGITAL DATA ON A SUBSTRATE AND THE DATA RECORD CARRIER FORMED THEREBY

Alan A. Jewer, Whitewater, Wis., assignor to News Log International, Inc., Janesville, Wis.

Filed Jun. 3, 1982, Ser. No. 384,582
Int. Cl.³ G11B 7/00, 21/00
U.S. Cl. 369—44 **61 Claims**



1. A method for optically encoding digital data on a substrate without timing or synchronization data to form a data record carrier including the steps of: selecting an arcuate track path on the substrate; selecting a data cell length in the direction of the track for each bit of data to be stored in each cell on each track; selecting a cell width dimension transverse to the direction of the track; selecting a non-transition cell for one form of logic (**0** or **1**) to be stored in each such cell; selecting a transition cell for the other form of logic (**1** or **0**) to be stored in each such other cell; creating at least one track of digital data on the substrate comprised of a series of cells each having the same cell length in the direction of the track; establishing in each non-transition cell on the substrate a fully reflective surface or fully non-reflective surface; establishing in each transition cell on the substrate a reflective surface over part of the cell extending transverse to the direction of the track and a non-reflective surface over the other part of the cell extending transverse to the direction of the track, and creating a plurality of arcuate tracks of cells on said substrate with each track being spaced from an adjacent track by a predetermined distance at a point intermediate the ends of each track and each track having the same radius throughout the arcuate path of said track such that the tracks extend in an arcuate manner across the data record carrier with each track having the same

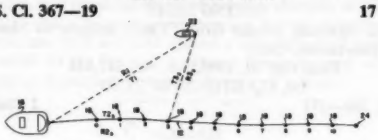
radius and being arranged in a nested manner relative to adjacent tracks along a common centerline.

4,532,617

SYSTEM FOR LOCATING A TOWED MARINE OBJECT

Donald R. Baecker, 6002 Cerritos, Houston, Tex. 77035, and Joseph V. Bijou, 5801 Clarewood #44, Houston, Tex. 77081

Filed Sep. 29, 1982, Ser. No. 428,320
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—19 **17 Claims**



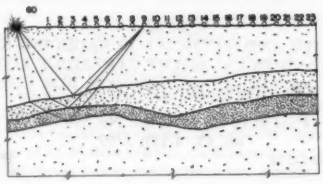
1. A system for locating a towed marine object relative to a towing vessel comprising:
(a) a towing vessel;
(b) a slave vessel spaced a known distance and positioned abeam of said towing vessel;
(c) a towed object connected to said towing vessel and having at least one acoustic transponder means associated therewith for interrogation by a first acoustic signal to cause said transponder means to emit a response acoustic signal;
(d) an acoustic transmitter-receiver located on a first one of said vessels for emitting said first acoustic signal and receiving said response signal;
(e) an acoustic receiver located on a second of said vessels for receiving said first and response acoustic signals;
(f) means for synchronizing said acoustic receivers; and
(g) means to transmit acoustic signal information from said second vessel to said first vessel.

4,532,618

SYSTEM FOR AND METHOD OF PROCESSING A SEISMIC SIGNAL

Kenneth R. Wener, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed May 20, 1982, Ser. No. 380,153
Int. Cl.³ G01V *1/28, 1/36*
U.S. Cl. 367—46 **9 Claims**



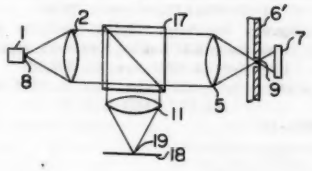
1. An improved method of seismic signal processing for use in the seismic surveying of subterranean formations located below the earth's surface through creation of seismic waves from a seismic source positioned on the earth's surface, said improved method comprising the steps of:
separately recording, at at least one location on said earth's surface, a plurality of seismic signals from said source, each of said plurality of recorded seismic signals being recorded in different bandwidths with adjacent bandwidths partially overlapping in frequency,
separately processing each of said plurality of seismic signals to optimize the recorded signals,
transforming each processed seismic signal, into (a) an amplitude-frequency signal and (b) a phase-frequency signal,
compositing the two (a) amplitude-frequency signals and (b) phase-frequency signals of adjacent bandwidths of each overlapping frequency region to produce a single composite (a) amplitude-frequency signal and (b) a single composite phase-frequency signal for the overlapping frequency region, and
reverse transforming the (a) amplitude-frequency signal and (b) phase-frequency signal of each transformed seismic signal including each composite signal to form a single broad-band amplitude-time seismic signal response for said at least one location.

4,532,619

METHOD AND APPARATUS FOR REDUCING SEMICONDUCTOR LASER OPTICAL NOISE

Toshio Sugiyama, Aichi, and Hideo Suenaga, Toyokawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,015
Claims priority, application Japan, Jan. 22, 1982, 57-7572; Apr. 7, 1982, 57-56581; Apr. 28, 1982, 57-70391
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—106 **32 Claims**



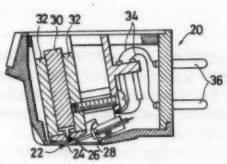
1. In an optical information processing apparatus having a single longitudinal mode semiconductor laser as a light source wherein a continuous light emitted from the light source is transmitted through an optical system and converged on a record medium, a method for reducing an optical noise of a semiconductor laser by feeding back 1%–10% of total emitted light per one facet of said semiconductor laser to an emitting point of said semiconductor laser.

4,532,620

COIL ASSEMBLY HAVING STACKED SPIRAL PATTERN LAYERS AND METHOD OF MAKING

Norio Matsuda; Toshio Konno; Kaneo Yamamoto; Shinya Tominaga; Susumu Kubo; Yasuyuki Mori; Naoki Akiyama, and Masaki Murakami, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Continuation of Ser. No. 72,696, Sep. 5, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 400,232
Claims priority, application Japan, Sep. 11, 1978, 53-124585
Int. Cl.³ H04R *9/16;* **G11B** *5/42*
U.S. Cl. 369—136 **8 Claims**



1. A coil assembly for use with a moving coil stereo phonograph pickup, comprising a pair of coils embedded in a unit body, each of said coils comprising:
(a) a nonconductive base;
(b) stacked spiral pattern layers made of conductive micros-

triplines, said spiral pattern layers being formed on said nonconductive base, the number of said spiral pattern layers being at least three;

(c) an insulating material forming a multiple overlay of polyimide films, one of said polyimide films being placed on one of said stacked spiral pattern layers and filling gaps between adjacent turns of said one of the stacked spiral pattern layers, which is located opposite to said base, each of the remaining polyimide films being interposed between any two consecutive spiral pattern layers and filling gaps between adjacent turns of one of said two consecutive spiral pattern layers, each of said polyimide films being formed through a heat process with which solvent of liquid polyimide is removed to harden the same so as to provide a flat surface of an insulating layer; and

(d) means for establishing electrical connection between said spiral pattern layers, said means comprising a conductive member connected between any two consecutive spiral pattern layers;

said pair of coils being arranged so that they are symmetrical with a center line which bisects said coil assembly.

4,532,621

DEVICE AND METHOD FOR RECORDING INFORMATION ON A DISK

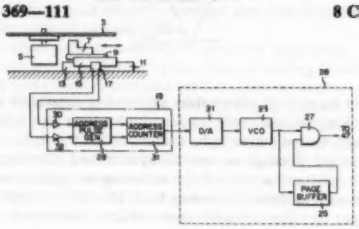
Akira Nakagawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

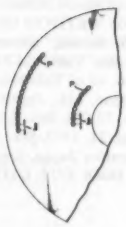
Filed Jun. 14, 1982, Ser. No. 388,507

Claims priority, application Japan, Jun. 18, 1981, 56-94428

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—111 **8 Claims**





1. A disk recording device for recording data on concentric circular or spiral tracks of a disk, comprising:

(a) a motor for rotating said disk at a constant speed;

(b) a head for recording data on or reproducing data from said rotating disk;

(c) position detecting means, operatively associated with said head, for detecting position of said head relative to said disk;

(d) position signal generating circuit means, electrically associated with said position detecting means, for generating a position signal; nad

(e) recording timing signal generating means, electrically associated with said position signal generating circuit means, for generating a recording timing signal of a train of pulses having intervals such that resulting recording density based thereon is constant at any radial position on said disk; wherein

said head is electrically connected to said recording timing signal generating means for recording or reproducing data in synchronism with said recording timing signal.

4,532,622

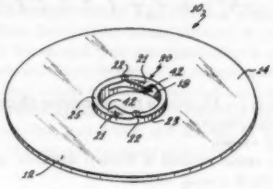
RECORD DISC, TURNTABLE AND METHOD FOR FIXING SAME

Roger A. Newbold, Garden Grove, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 31, 1983, Ser. No. 547,143

Int. Cl.³ G11B *25/04, 23/00*

U.S. Cl. 369—271 **2 Claims**



1. The combination of a record disc and a turntable permanently fixed together comprising:

a record disc having a preselected number of grooves prerecorded thereon, and a central opening formed in the record disc;

interlock and detent means formed on said record disc adjacent said opening;

a central shaft fixed to said turntable for rotatably mounting said turntable in a housing;

a plurality of slots and a holding means formed in said turntable adjacent to the lower portion of said shaft;

said record disc being permanently, fixedly mounted to said turntable by insertion of the central opening of said record disc over said central shaft until said interlock means on said record disc enters said plurality of slots in said turntable; and rotating said record disc with respect to said turntable until said interlock means is captured within said slots by action of said detent means coacting with said holding means to thereby permanently hold said record disc to said turntable.

4,532,623

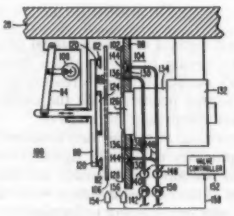
APPARATUS AND METHOD FOR REDUCING SHOCK AND VIBRATION CAUSED BY CARTRIDGE LOADING

Peter J. Coyle, Oaklyn, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 19, 1984, Ser. No. 590,794

Int. Cl.³ G11B *3/60*

U.S. Cl. 369—271 **10 Claims**



1. An apparatus for reducing the shock induced by the impact of a cartridge with a mounting plate including a first and a second plurality of orifices, said apparatus comprising:

means for sensing motion of said cartridge toward said mounting plate;

means responsive to said sensing means for introducing pressurized air between said cartridge and said mounting plate while said cartridge is in motion toward said mounting plate, said means for introducing pressurized air including pump means coupled to said first plurality of orifices; and

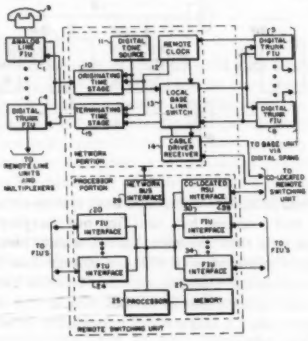
means for retaining said cartridge against said mounting plate, said retaining means including a plurality of vacuum cups and a vacuum pump coupled thereto, wherein said vacuum cups are held against a side surface of said cartridge by the force of a vaccum drawn by said vacuum pump through said second plurality of orifices.

4,532,624

PARITY CHECKING ARRANGEMENT FOR A REMOTE SWITCHING UNIT NETWORK

Robert E. Renner, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 3, 1983, Ser. No. 548,482
Int. Cl.³ H04Q *11/04*; H04J *3/14*
U.S. Cl. 370—13 **31 Claims**



1. In a telecommunications system, a parity checking arrangement for a remote switching unit, which is connected between subscribers and other switching systems via a plurality of interface equipment, said parity checking arrangement for said remote switching unit comprising:

first and second PCM buses connected to said subscribers via said interface equipment for transmitting a plurality of PCM data samples, each including a parity bit;

third and fourth PCM buses connected to said other switching systems via said interface equipment for transmitting a plurality of PCM data samples, each including a parity bit;

digital span means connected between said plurality of interface equipment and said other switching system and being operated to transmit said PCM data between said remote switching unit and said other switching systems;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM samples from said interface equipment, said first and second originating time switching means being connected to said interface equipment via said first and second buses respectively;

first and second space switching means, each including:

first latching means connected to said corresponding first and second originating time switching means, said first latching means operated in response to said subsequently transmitted PCM samples to store said PCM sample during each time slot;

first multiplexing means connected to said first latching means and operated to transmit said stored PCM samples during each time slot in response to first and second operating signals of first predefined values; and

second latching means connected to said first multiplexing means and being operated to store said PCM samples transmitted through said first multiplexing means during each said time slot;

selecting means connected to said first multiplexing means, to said first latching means, and to said interface equipment via said third and fourth PCM buses, said selecting means being operated to receive and to transmit said PCM data samples from said other switching systems during each said time slot;

said first multiplexing means being further operated, in response to said received PCM data samples of said other switching systems, to transmit said received PCM samples during time slots in response to said first and second operating signals of second predefined values;

said selecting means being further operated in response to said stored PCM samples of said first latching means to transmit said stored PCM samples to said interface equipment via said third and fourth PCM buses for transmission through said digital span means;

first parity checking means connected between said first latching means and said first multiplexing means, between said first multiplexing means and said second latching means, said parity checking means being operated in response to said transmitted parity bit of each said PCM samples to determine whether said parity bit of each said PCM sample is a correct value;

said first parity checking means being further operated to generate a plurality of first bad parity signals for a detection of an incorrect parity bit of any PCM sample; and

said first parity checking means being further operated to store said PCM sample having an incorrect parity bit; and said remote switching unit further comprising:

first and second terminating time switching means being connected respectively between said first and said second space switching means via said second latching means and said interface equipment, said first and second terminating time switching means respectively operated to switch said PCM samples from said first and second space switching means to said interface equipment for transmission to said subscribers.

4,532,625

COMMUNICATIONS NETWORK STATUS INFORMATION SYSTEM

Harris A. Stover, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 17, 1983, Ser. No. 542,635
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **24 Claims**

1. In a communication network that includes at least three nodes and links connecting each node to at least one other node such that each node can communicate with every other node, the improvement comprising a device located at each node for providing and receiving a message to and from each node in the network, said device comprising:

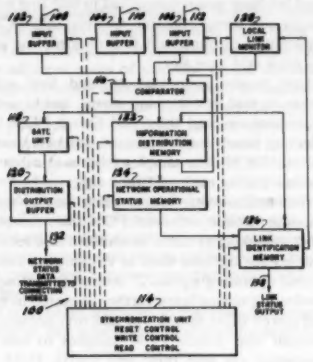
a synchronization means that is synchronized with the other synchronization units at the other nodes for controlling the operation of other components of said device;

an input buffer for each link connected to the node for temporarily storing messages transmitted over the link;

an information distribution memory under control of said synchronization means for storing information; and

comparing means connected to said input buffers and to said information distribution memory for comparing under control of said synchronization means messages received from said input buffers with selected information stored in

said information distribution memory and for storing the result of said comparison in said information distribution memory, said information selections being made based on the time said comparison is made.



4,532,626

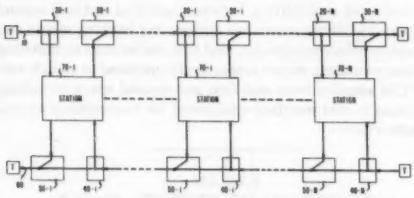
COLLISION AVOIDING SYSTEM AND PROTOCOL FOR A TWO PATH MULTIPLE ACCESS DIGITAL COMMUNICATIONS SYSTEM

Christopher Flores, Berkeley, Calif.; Bhaskarpillai Gopinath, and John O. Limb, both of Berkeley Heights, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 19, 1982, Ser. No. 399,428

Int. Cl.³ H04J *3/02, 3/00, 6/00*

U.S. Cl. 370—85 **20 Claims**



1. A method for controlling digital signals in a communications system, said system including a plurality of stations, at least two of said stations being coupled to both a first and a second signal path, said method including the steps of writing signals on said first path and reading signals from said second path and characterized in that

said signals on said first path include first control and data signals,

said signals on said second path include second control and data signals,

said first and second paths are, separate, independent, unidirectional and oppositely directed with respect to each other, and

said method further comprising the steps of

reading said first control signals from said first path, said first path reading step occurring logically before said writing on said first path,

responsive to first control signals read from said first path avoiding a collision on said first path,

writing second control signals on said second path, said second path writing step occurring logically after said reading from said second path

responsive to second control signals read from said second path, avoiding a collision on said second path.

4,532,627

TIME MULTIPLEX CONTROLLED DATA SYSTEM

Ashjorn Smitt, Vedbaek, Denmark, assignor to Christian Rovsing A/S, Ballerup, Denmark

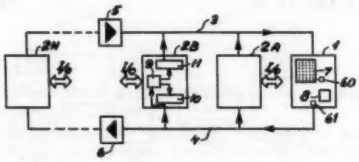
Continuation of Ser. No. 193,530, filed as PCT DK 79/00041, published as WO 80/00883, May 1, 1980, § 102(e) date Jun. 27, 1980, abandoned.

This application Feb. 18, 1983, Ser. No. 467,903

Claims priority, application Denmark, Oct. 27, 1978, 4792/78; Nov. 30, 1978, 5396/79

Int. Cl.³ H04J *3/16, 6/00*

U.S. Cl. 370—85 **5 Claims**



1. A time multiplex controlled data system comprising:

a first and a second bus, said first bus carrying a first data block in a first direction, said first data block including control information (F,SD) and storage data (D), and said second bus carrying a second data block in a second direction, said second data block including device identification signals (MUL), said control information (F,SD), and said storage data (D);

a control unit coupled between said first and second bus;

a plurality of data processing units coupled between said first and second buses, each of said plurality of data processing units including:

means for sensing said control information and said device identification signals (MUL) indicative of which one of said plurality of data processing units and said control unit is permitted to receive said storage data and which unit is to transmit next on said first bus; and,

means for controlling the transmission of said first data block dependent upon the sensing of said device identification signals (MUL) and one of a plurality of timing pulses;

means for transmitting said first data block synchronously with respect to said one of said plurality of timing pulses to said control unit in said first direction via said first bus; said control unit including:

a pulse generator means for generating said plurality of timing pulses; a multiplex memory;

a cyclic scanning means coupled to said multiplex memory for reading out multiplex information therefrom, said multiplex information representing said device identification signals (MUL);

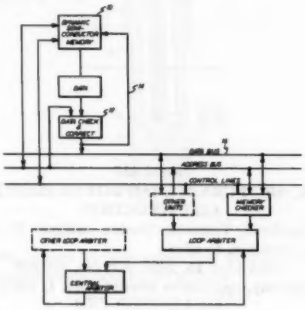
means for receiving said first data block received from said first bus and for introducing said device identification signals (MUL) into said first data block to obtain said second data block; and,

transmission means for transmitting, to said data processing units in said second direction, said second data block via said second bus.

4,532,628
SYSTEM FOR PERIODICALLY READING ALL MEMORY LOCATIONS TO DETECT ERRORS

David J. Matthews, Arlington, Mass., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 28, 1983, Ser. No. 470,901
Int. Cl.³ G06F 11/10
U.S. Cl. 371—13 3 Claims



1. In a computer system including a solid state memory with a plurality of addressable locations and an error detector/corrector circuit for checking data as it is read from the memory and correcting the data if a detectable error has occurred, the corrected data being stored in the addressed memory location to assure that the correct data is in memory, a circuit to identify all directly addressable memory locations present and to periodically read each present location comprising, in combination:

address generator means operative during a search mode for producing each directly addressable memory location;

read request means to request, during said search mode, that each address produced by said address generator be read by the memory;

storage means responsive to each read request to store an indication from the memory whether the addressed location is present or not present;

said address generator operative during a normal run mode to generate periodically all possible directly addressable locations at a rate slower than addresses are generated thereby during said search mode;

means operative during normal run mode, and responsive to said storage means and said address generator to initiate a memory read whenever the address produced by said address generator is indicated to be present by the data in said storage means.

4,532,629
APPARATUS FOR ERROR CORRECTION

Tsuneo Furuya, and Tadashi Fukami, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,128
Claims priority, application Japan, Jan. 19, 1982, 57-6543
Int. Cl.³ G06F 11/10
U.S. Cl. 371—38 12 Claims

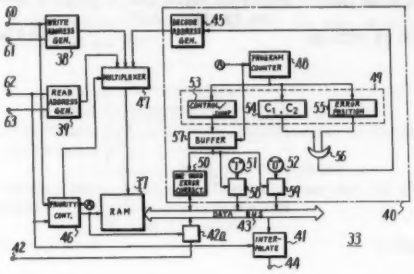
1. Apparatus for correcting errors in data sequences formed of plural, time-base arranged data words and check words that are written into a read/write memory under control of a write address generator and are subsequently read out of the read/write memory under control of a read address generator so as to generate rearranged data sequences, the apparatus comprising:

arithmetic error word correction means connected to said read/write memory for performing error correction calculations on a data word to be corrected;

pointer addition means;

circuit means connecting said pointer addition means to said read/write memory;

said pointer addition means being responsive to an error state of said sequences for adding a pointer to said data words; and

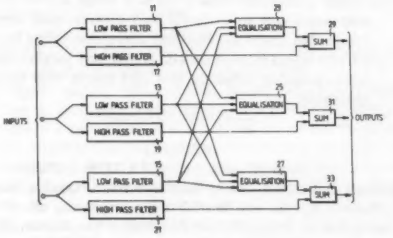


read-only memory means containing a control microprogram for arranging said read-only memory means in fields for controlling the operation of said arithmetic error word correction means and of said pointer addition means and to provide a data word address signal representative of a word to be corrected for error.

4,532,630
SIMILAR-REDUNDANT SIGNAL SYSTEMS

John M. Corney, Kent, England, assignor to Marconi Avionics Limited, England

Filed May 17, 1982, Ser. No. 378,726
Claims priority, application United Kingdom, May 28, 1981, 8116384
Int. Cl.³ G06F 11/16
U.S. Cl. 371—68 5 Claims



1. A similar-redundant signal system comprising:

(A) a plurality of nominally identical signal paths each comprising a number of elements serially connected,

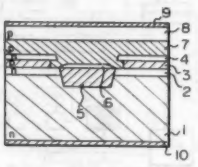
(B) a failure detection means comprising comparator means having a plurality of inputs equal in number to the number of signal paths to which the input signals at corresponding first locations in said signal paths are respectively applied; and

(C) equalizing means connected in said signal paths at corresponding second locations upstream of said first locations by at least one said element, said equalizing means having a plurality of inputs equal in number to the number of signal paths to each of which the signal on a respective one of said signal paths is applied, and having a plurality of outputs equal in number to the number of said signal paths, said equalizing means rendering substantially identical only those components of the signals at said outputs which are below a predetermined frequency.

4,532,631
SEMICONDUCTOR LASERS AND METHOD FOR PRODUCING THE SAME

Katsuhito Shima, Yokohama, and Kiyoshi Hanamitsu, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 5, 1982, Ser. No. 432,806
Claims priority, application Japan, Oct. 5, 1981, 56-158447
Int. Cl.³ H01S 3/19
U.S. Cl. 372—48 4 Claims



1. A semiconductor laser having cleavage planes, comprising:

a compound single crystalline semiconductor substrate;

a current-blocking multilayer, formed on said compound single crystalline semiconductor substrate, having an upper layer and a lower layer forming a reverse-biased PN junction, said compound single crystalline semiconductor substrate and said multilayer having a groove formed therein, extending from the upper layer of said multilayer into said compound single crystalline semiconductor substrate, recesses formed in the sides of said groove by selectively etching said lower layer;

a lower clad layer, embedded in said groove, extending from the bottom of said groove to a lower edge of said recesses;

a stripe active layer formed on said lower clad layer, having an upper plane and a lower plane, and having sides inclined toward said upper and lower planes, said upper and lower planes being substantially parallel to each other;

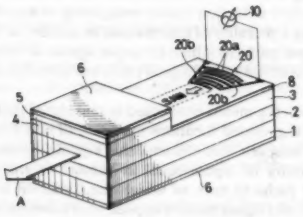
an upper clad layer formed on said stripe active layer and said multilayer so as to fill said groove, said lower and upper clad layers surrounding said stripe active layer; and

electrode layers formed on said compound single crystalline semiconductor substrate and said upper clad layers, respectively.

4,532,632
TUNABLE SEMICONDUCTOR LASER

Tsukasa Yamashita, Nara; Kazuhiko Mori, Osaka; Masaharu Matano, Kyoto, and Norihiro Ota, Saitama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 30, 1982, Ser. No. 403,819
Claims priority, application Japan, Jul. 31, 1981, 56-120852
Int. Cl.³ H01S 3/19
U.S. Cl. 372—50 13 Claims



1. In a tunable semiconductor laser having an active layer, the laser comprising:

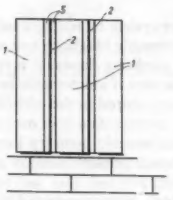
an insulating film made of piezoelectric material formed above a portion of the active layer; and

means for selectively reflecting light of a specified wavelength emitted within the active layer, the reflecting means being capable of varying the wavelength of the light to be reflected and being provided on the insulating film.

4,532,633
DC ARC FURNACE IMPROVED HEARTH CONSTRUCTION

Sven E. Stenkvist, Västerås, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed May 16, 1984, Ser. No. 610,698
Claims priority, application Sweden, Jun. 1, 1983, 8303087
Int. Cl.³ H05B 7/00
U.S. Cl. 373—72 3 Claims



1. A DC arc furnace conductive hearth lining comprising a brickwork formed by bricks having bottoms and tops contacted by a furnace melt, electric conductors extending through the brickwork from the bottoms to the tops of the bricks, the conductors having upper portins which become molten metal when heated by the melt and form sumps of molten metal which can circulate, and shields positioned between the conductors and the bricks and extending for the lengths of the conductors including their upper portions which become molten, the bricks being made of a refractory having a relatively low resistance to erosion from circulating molten metal and the shields being made of a refractory having a relatively higher resistance to such erosion.

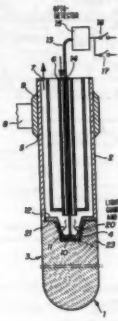
4,532,634
ELECTRODE FOR ELECTRIC ARC FURNACES

Thomas Taube, Erlangen-Steudach, and Inge Lauterbach-Dammler, Nuremberg, both of Fed. Rep. of Germany, assignors to ARC Technologies Systems Ltd., Cayman Islands, British West Indies

Filed Sep. 13, 1983, Ser. No. 531,921
Claims priority, application Switzerland, Sep. 13, 1982, 5412/82
Int. Cl.³ H05B 7/07
U.S. Cl. 373—93 14 Claims

1. An electrode for arc furnaces, comprising a metallic upper section and a replaceable, consumable lower section and an

interconnection means, said electrode including at least one light-receiving element internally positioned within said electrode upper section or interconnection means and in face-to-face relationship with said lower section.



4,532,635

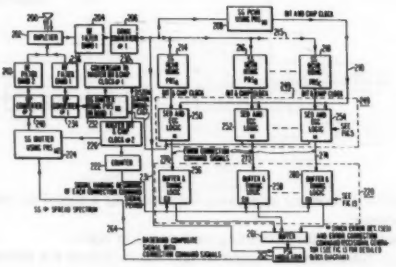
SYSTEM AND METHOD EMPLOYING TWO HOP SPREAD SPECTRUM SIGNAL TRANSMISSIONS BETWEEN SMALL EARTH STATIONS VIA A SATELLITE AND A LARGE EARTH STATION AND STRUCTURE AND METHOD FOR SYNCHRONIZING SUCH TRANSMISSIONS

Visvaldis Mangulis, East Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 19, 1983, Ser. No. 524,542

Int. Cl.³ H04B *7/185*

U.S. Cl. 375—1 **6 Claims**



2. In a data communication system including a plurality of small earth stations (SES), a satellite, and a master earth station (MES), a method of transmitting signal transmissions each consisting of a series of time synchronous orthogonal pseudo random sequence (PRS) signals, each in turn consisting of N time synchronous chips arranged in a predetermined pattern, from a first SES to a second SES and comprising the steps of:

generating a stream of PRS signals consisting of bits and chips of bit and chip rates B_{SES} and C_{SES} at selected ones of said SESs and having pause periods occurring periodically in said stream of PRS signals;

transmitting said PRS signals to said satellite and then from said satellite to said MES as a single composite signal with B_{SES} and C_{SES} and the pause periods all synchronized;

determining if each B_{SES}, C_{SES} and the pause periods of all of said PRS signals from said SESs are in common phase synchronization with each other at the time of arrival thereof at said MES;

generating an error correction code (ECC) defining the amount and direction of phase error with respect to said common phase synchronization of any of said B_{SES}, C_{SES} or pause periods;

transmitting said composite signal from said MES to said SESs with common periodic pause periods therein and with said ECC signal contained in one or more of said common pause periods; and

correcting the phase of the B_{SES}, C_{SES}, and pause period of each PRS_{SES} at said SESs so that they are all in phase synchronization with each other at the time of arrival thereof at said MES.

4,532,636

RADIO COMMUNICATIONS RECEIVERS

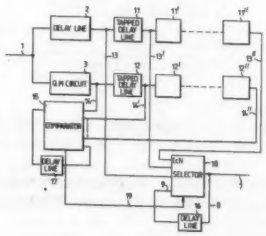
Dent P. Wilkinson, Hampshire, England, assignor to The Marconi Company Limited, England

Filed Jun. 18, 1982, Ser. No. 389,905

Claims priority, application United Kingdom, Jun. 22, 1981, 8119215

Int. Cl.³ H04B *1/10*

U.S. Cl. 375—1 **8 Claims**



1. A frequency hopping radio communication receiver which has a hop period of T1 and comprising

(A) store means to store a representation of a received signal for a period of T2;

(B) selection means which is responsive to a control signal selectively to output either

(i) a currently received signal or

(ii) the stored representation from said store means of a received signal received T2 earlier; and

(C) signal quality measurement means which determines from at least one characteristic of the received signal in each of a succession of said periods T1 within those periods, whether the received signal comprises more than one transmitted signal and, if so, generates and forwards said control signal to said selection means such that, for any of the periods T1 in which the received signal comprises more than one transmitted signal, the stored representation from said store of an earlier received signal is output by the receiver.

4,532,637

DIFFERENTIAL RECEIVER

Reuben E. Maine, Charlottesville, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,432

Int. Cl.³ G01S *5/08*

U.S. Cl. 375—10 **12 Claims**

1. An apparatus for determining phase differentials between a plurality of received signals comprising:

first and second means for receiving signals at a first frequency;

local oscillator means for providing a plurality of local oscillator signals;

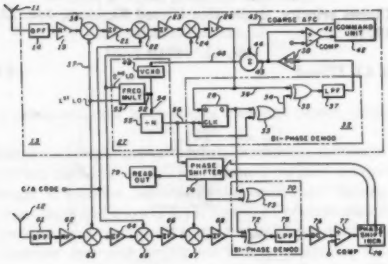
first and second heterodyning means coupled to receive said plurality of local oscillator signals and respectively to said first and second receiving means for down converting said

signals at said first frequency signals at a second frequency;

first phase comparator means coupled to receive said signals at said second frequency from said first heterodyning means and signals representative of said local oscillator signals for providing signals to said local oscillator means representative of phase differences between said local oscillator signals and said signals at said second frequency of said first heterodyning means;

means coupled to said local oscillator means for imparting phase shifts to said local oscillator representative signals, thereby providing phase shifted representative signals;

second phase comparator means slaved to said first phase comparator means, coupled to receive said phase shifted representative signals and said signal at said second frequency from said second heterodyning means for providing signals representative of phase differences therebetween;



means coupled to receive said phase difference representative signals from said second phase comparator for providing a phase shift control signal to said phase shifting means which is representative of phase differences between said phase shifted representative signal and said signal at said second frequency from said second heterodyning means, whereby said phase shifting means provides phase shifts representative of said phase differences between signals at said first and second receiving means when said signal at said second frequency from said second heterodyning means and said phase shifted representative signal are of substantially equal phases.

4,532,638

METHOD AND APPARATUS FOR THE EXPONENTIATION OF LARGE BINARY NUMBERS IN A RESIDUE CLASS MODULO N, PARTICULARLY FOR ENCODING AND DECODING DIGITALLY-REPRESENTED MESSAGES

Helmut Lagger, Ottobrunn, Fed. Rep. of Germany; Elisabeth Schmid, Mauerkirchen, and Erich Haider, Linz, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 400,996

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138698

Int. Cl.³ H03K *13/00*; G06F *7/52*

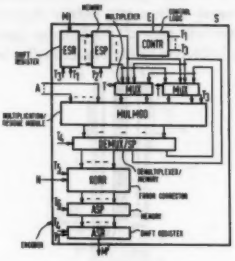
U.S. Cl. 375—17 **6 Claims**

4. A method of exponentiating large binary numbers A and B, in a residue class modulo N for encoding and decoding digitally-represented messages, comprising the steps of:

repetitively exponentiating a binary number in a plurality of squaring/multiplication cycles having residue formation;

each of the cycles comprising the step of multiplying the numbers A and B which are numbers to the base 2^m and the step of forming a residue nearly time-parallel with the step of multiplying;

said step of forming a residue including a step of multiplying in accordance with a fixed matrix;



dividing a message into a plurality of message blocks; and respectively encoding, transmitting and decoding the message blocks individually.

4,532,639

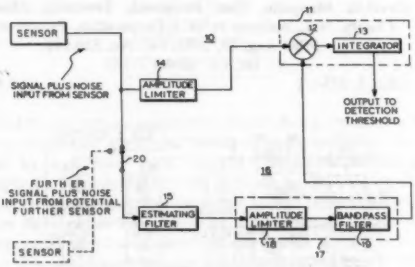
CFAR RECEIVER APPARATUS FOR DETECTING A SIGNAL IN NOISE

Robert Price, Lexington, and Richard R. Kurth, Sudbury, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,480

Int. Cl.³ H04L *1/00*

U.S. Cl. 375—96 **14 Claims**



1. CFAR receiver apparatus for detecting a signal in noise comprising:

sensor means for providing said signal in noise,

linear filter means coupled to said sensor means for providing an estimate of said signal,

correlator means,

a first signal branch coupling said sensor means to said correlator means,

a second signal branch coupling said linear filter means to said correlator means, and

amplitude limiting means in at least one of said first and second branches for effecting CFAR detection performance of said apparatus.

4,532,640

PHASE TRACKING LOOP FOR DIGITAL MODEM

Gordon Bremer, Clearwater; William Betts, Maderia Beach, and Kenneth Martinez, Pinellas Park, all of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Aug. 12, 1982, Ser. No. 407,451

Int. Cl.³ H03L *7/08*

U.S. Cl. 375—120 **3 Claims**

1. A phase tracking loop for a digital modem of the type wherein the eye pattern constellation output of the modem

equalizer is rotated by a phase corrector angle ϕ by rotating means, said tracking loop comprising:

means for multiplying the rotated eye pattern coordinates by a phase reference number to generate a phase error signal;

a frequency offset integrator which integrates the phase error signal to generate a frequency offset signal,

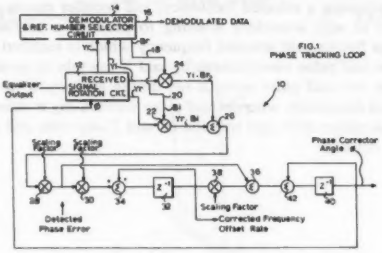


FIG.1
PHASE TRACKING LOOP

a sumer which has an output equal to the sum of the frequency offset signal and the phase error signal; and

a phase correction integrator which integrates the output of the sumer to generate said phase corrector angle ϕ.

4,532,641
CASH ACCOUNTING SYSTEM

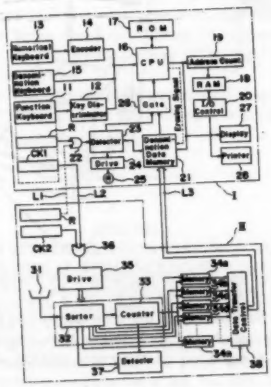
Katsuji Nishimura, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,020

Claims priority, application Japan, Jul. 20, 1981, 56-114549; Jul. 21, 1981, 56-114909; Jul. 24, 1981, 56-116999; Sep. 2, 1981, 56-138741

Int. Cl.³ G06C *27/02, 29/00*

U.S. Cl. 377—14 **9 Claims**



1. A cash accounting system comprising:

cash counting means for sorting each piece of money including bills introduced therein and for counting the amount of each denomination of said money, said cash counting means including,

means for sorting said introduced money into separate denominations,

means, responsive to said means for sorting, for counting the number of pieces of each denomination of money introduced and producing an output representative thereof,

means, responsive to the output of said means for counting, for storing the count data representative of the number of pieces of each denomination of money, and

means, responsive to said means for sorting and means for counting, for detecting the sorting and counting of the last piece of money introduced into said cash counting means and producing a count completion signal in response thereto;

cash register means for registering transaction data, said cash register means including,

keyboard input means for introducing data and function commands,

processor means, responsive to said keyboard input means, for manipulating said introduced data to form completed transaction data, and

memory means for storing said transaction data developed by said processor means;

data count read means for reading said count data stored in said means for storing of said cash counting means and for providing said count data to said processor means of said cash register means.

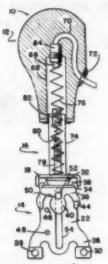
4,532,642
COUNTING STAMPER APPARATUS

James A. Morris; Curtis L. Hancock, both of Charlottesville, and John L. Wiley, Chesapeake, all of Va., assignors to Spectrum Manufacturing Inc., Charlottesville, Va.

Filed Sep. 30, 1982, Ser. No. 431,489

Int. Cl.³ G07C *3/00*

U.S. Cl. 377—15 **22 Claims**



1. Marking and counting apparatus comprising

a base having a distal end for resting upon a surface to be marked a proximal portion spaced therefrom,

a marking element mounted on the base and moveable with respect thereto,

means for moving the marking element,

switch actuator means having a portion stationary with respect to the base when the marking element approaches the distal end of the base,

a switch mounted for movement with said marking element, said switch being actuated by the actuator means whenever the marking element is moved into the distal end of the base, and

counter means connected to the switch for counting the number of times the switch is actuated, and

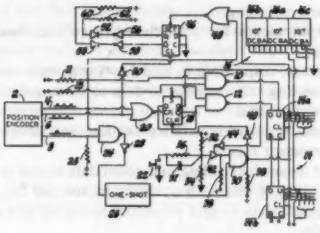
timer means connected to the switch means for timing the duration of the marking element in the distal end of the base and for producing a signal when the duration exceeds a predetermined limit.

4,532,643

BIDIRECTIONAL ONE-HALF RATE COUNTER

Ralph A. Thompson, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 20, 1982, Ser. No. 419,936
Int. Cl.[3] H03K *23/26, 21/32, 21/36;* G06M *1/27*
U.S. Cl. 377—45 **4 Claims**



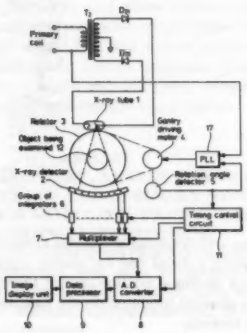
1. A half-rate bidirectional counting circuit comprising an up/down counter having an UP input and a DOWN input, first and second gate means connected with a source of UP pulses and a source of DOWN pulses, respectively, for respectively gating said UP and DOWN pulses to said UP and DOWN inputs, bistable means for alternately enabling said first and second gate means in response to either an UP or DOWN pulse and means for initializing said bistable means and said counter.

4,532,644

X-RAY COMPUTERIZED TOMOGRAPH

Keiki Yamaguchi; Tadashi Ogawa; Masayoshi Mitamura, and Tooru Shimizu, all of Musashino, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,144
Claims priority, application Japan, Oct. 8, 1982, 57-177275
Int. Cl.[3] G03B *41/16*
U.S. Cl. 378—16 **15 Claims**



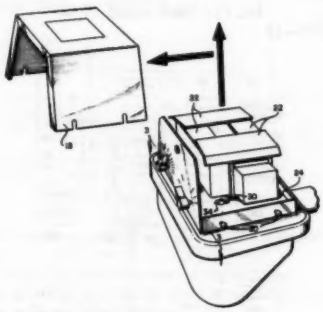
1. An X-ray computerized tomograph system comprising an X-ray tube having at least an anode and a cathode electrodes for producing pulse wave X-rays according to pulse wave voltages having a predetermined period, applied across said anode and said cathode electrodes; an X-ray detector facing said X-ray tube with an object being examined disposed therebetween, for producing a data signal representing the X-ray signals transmitted through said object; means for rotating said X-ray detector and said X-ray tube; means for detecting rotational position of said object relative to said X-ray tube and said X-ray detector; phase locked loop means responsive to the detected result of said rotational position and the frequency of the input voltage supply, for proportionally syncronizing the rotating movement of said X-ray tube and X-ray with said frequency of said input voltage supply; means for integrating the output of said X-ray detector syncronously with said pulse way X-rays; means for forming a tomogram of said object on the basis of said data signal produced by said X-ray detector; an image display unit for displaying said tomogram; a single phase transformer having primary winding and secondary winding, said primary winding being connectable to an input voltage supply having a selected frequency; and rectifier means connected to said secondary winding to produce a secondary voltage having said selected frequency which is rectified and used as said pulse wave voltage by said X-ray tube to produce at least one said pulse wave X-ray during each cycle of said selected frequency, wherein said pulse wave X-ray is substantially in phase with said rotation of said X-ray tube and said X-ray detector.

4,532,645

QUICK RELEASE AND ADJUSTABLE COLLIMATOR DEVICE

William W. Morris, Woodstock, Ill., assignor to X-Cel X-Ray Corporation, Crystal Lake, Ill.

Filed Sep. 28, 1983, Ser. No. 536,536
Int. Cl.[3] F16M *9/00*
U.S. Cl. 378—147 **11 Claims**



1. An X-ray apparatus comprising a collimator device connected to an X-ray tube device having a frame base;

said frame base having an inner surface and an outer surface;

said collimator device including a base member which is releasably mounted on the outer surface of said frame base;

a subplate means mounted to the inner surface of said frame base;

said subplate and frame base being adjustably connected to each other;

said subplate means being free of contact with said base member whereby said frame base is disposed between said collimator base member and said subplate means;

said base member is removable from said frame base free of interference with said subplate; and,

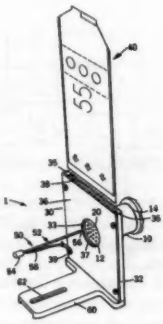
first mounting means for releasably connecting said collimator base member to said subplate;

whereby said collimator device is removable from said frame base.

4,532,646
X-RAY FOCAL SPOT LOCATING APPARATUS AND METHOD

Hubert W. Gilbert, Cedar Crest, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 16, 1983, Ser. No. 504,905
Int. Cl.³ G01D *18/00*
U.S. Cl. 378—207 **9 Claims**



1. A beam finder for locating and marking the focal spot of a beam generator comprising:

a mass of material relatively opaque to the generated beam, said mass having first and second axially-aligned, parallel-opposed faces connected by a plurality of substantially identical parallel holes extending perpendicular to said faces through said mass, the minimum distance between said faces being at least twenty-five times the average diameter of said holes;

film holder means for holding beam sensitive film tightly against said first opposed face; whereby said second opposed face is mounted against a beam generator and film is exposed through said holes, the focal spot of the generator being indicated on the film by the outline of the hole having the greatest exposure; and

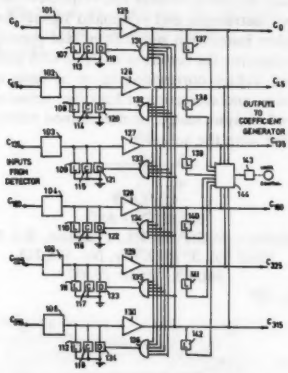
probe means for marking the beam generator through the beam finder hole through which the focal spot was indicated on said film.

4,532,647
AUTOMATIC DIMENSION CONTROL FOR A DIRECTIONAL ENHANCEMENT SYSTEM

Martin E. G. Willcocks, Somersham, Great Britain, assignor to John C. Bogue, Los Angeles and Wesley Ruggles, Jr., Marina Del Ray, both of, Calif.

Continuation of Ser. No. 294,242, Aug. 19, 1981, abandoned, which is a continuation of Ser. No. 166,174, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 885,958, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 779,436, May 23, 1977, abandoned, which is a continuation of Ser. No. 667,348, Mar. 16, 1976, abandoned. This application May 4, 1984, Ser. No. 606,862
Int. Cl.³ H04S *3/02*
U.S. Cl. 381—22 **5 Claims**

4. In a directional enhancement system for a multichannel sound system in which a processor section comprises a plurality of directional control signal generating means, each said directional control signal generating means producing a directional control signal at its output terminal and a plurality of coefficient generator means having input terminals which respond to said directional control signals which are applied thereto, the improvement comprising an automatic dimension control comprising,

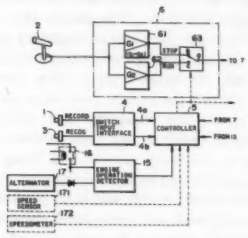


limiting means for automatically limiting all said directional control signals present to a level directly related to the number and strengths of such signals.

4,532,648
SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso, Yokosuka; Norimasa Kishi, Yokohama, and Toru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 29, 1982, Ser. No. 428,230
Claims priority, application Japan, Oct. 22, 1981, 56-169176
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—41 **7 Claims**



1. A speech recognition system for an automotive vehicle for recording or recognizing a spoken instruction received through a microphone and for activating a vehicle actuator in response to a recognized spoken instruction, which comprises:

(a) means for detecting whether or not an automotive vehicle engine is operating and outputting one of an engine operating signal and an engine stopped signal;

(b) a speech input and voice detection section connected to the microphone for amplifying a spoken instruction signal transduced through the microphone, detecting the start and end of a spoken instruction, and outputting an instruction start command signal and an instruction end command signal, respectively, in response to detection thereof, at least one of the gain factor in said speech input section and the threshold level in said voice detection section being so adjusted that the sensitivity to spoken instructions can be reduced and that the driver must necessarily utter a spoken instruction in a louder voice to reduce the proportion of noise level to spoken instruction

signal level, when said engine operation detecting means outputs said engine operating signal; and

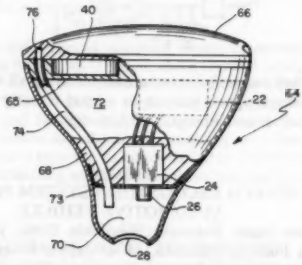
(c) a voice analysis section connected to said speech input and voice detection section and responsive to instruction start and instruction end command signals for analyzing the spoken instruction signal from said speech input section, comparing the results of analysis with predetermined reference values corresponding to at least one spoken instruction, and activating at least one actuator when the results of analysis match predetermined reference values associated with the actuator.

4,532,649

HEARING AID

Gaspare Bellafiore, 58 Stevens Rd., Cranston, R.I. 02910

Filed Jul. 3, 1983, Ser. No. 511,221
Int. Cl.³ H04R 25/00
U.S. Cl. 381—69 **14 Claims**



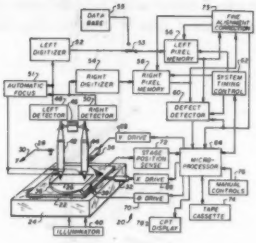
1. A hearing aid, comprising an ear plug for insertion wholly within the auditory canal of the ear of a user, said ear plug including a body portion that is formed with a generally tapering configuration that reduces from an enlarged outer generally oval portion to an inner end portion, said inner end portion having a generally rounded configuration that provides for easy insertion of said ear plug into the auditory canal, said ear plug being of a size and configuration that provides for insertion of substantially the entire body portion thereof into said auditory canal, wherein the concha portion of the user's ear is substantially exposed for receiving and collecting sound therein, a battery mounted in said body portion, microphone means mounted in said body portion and being exposed for receiving sound as collected by the concha portion in the user's ear, means located wholly within said body portion and electrically communicating with said microphone means for amplifying the sound signals received by said microphone means, a sound tube located in said body portion and communicating with said auditory canal and receiving said amplified sound for transmission to the auditory canal of the user, control means mounted on said outer portion for controlling the sound as transmitted to said tube, a cover member mounted on said ear plug for covering the outer portion of said body portion for concealing said control means and battery and defining a smooth substantially unobstructed outer surface of said ear plug that is ornamentally pleasing as inserted into the auditory canal of the user, a barrier located interiorly of said body portion and separating the interior of said body portion into spaced chambers that are sealed from each other, said sound tube being located in one of said chambers and said amplifier means being located in the other chamber, and a sealing member defined by a plastic film that is secured to the wall of the barrier that is adjacent to said one chamber into which said sound tube extends and being further secured to the adjacent interior walls of said body portion to seal said one chamber from said barrier, thereby preventing material from which said barrier is formed from filtering into said one chamber.

4,532,650

PHOTOMASK INSPECTION APPARATUS AND METHOD USING CORNER COMPARATOR DEFECT DETECTION ALGORITHM

Tim S. Wihl, and Mark J. Wihl, both of San Jose, Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Filed May 12, 1983, Ser. No. 494,762
Int. Cl.³ G06K 9/00
U.S. Cl. 382—8 **25 Claims**



1. A method for detecting defects in a reticle, metal mask or another object such as a photomask having a plurality of duplicate two dimensional image patterns, for using in comparing two like patterns and indicating defects wherever the patterns do not match, said method comprising the steps of:

forming a first representation of a first of said patterns;

forming a second representation of the second of said patterns for comparison to said first representation, each of said representations being composed of a two dimensional array of uniformally spaced apart pixels having relative positions that correspond to particular positions on the object being inspected, each said pixel having a value that indicates the absence or presence of pattern image at the particular position represented by that pixel;

forming a first matrix of a group of n×m adjacent pixels of said first representation;

forming a second matrix of a group of n×m adjacent pixels of said second representation, where n and m are integers;

inspecting differences between adjacent pixels of said first matrix and providing first gradient and toggle information indicative of certain characteristics of a first portion of said first pattern represented thereby and providing second gradient and toggle information indicative of certain characteristics of a first subportion of said first portion of said first pattern;

inspecting differences between adjacent pixels of said second matrix and providing third gradient and toggle information indicative of certain characteristics of a second portion of said second pattern represented thereby and fourth gradient and toggle information indicative of certain characteristics of a second subportion of said second portion of said second pattern;

combining said first and fourth gradient and toggle information to develop a first defect signal indicative of any defect appearing at a particular position in said second pattern; and

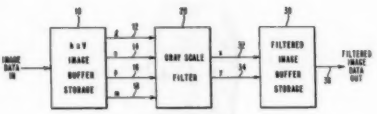
combining said second and third gradient and toggle information to develop a second defect signal indicative of any defect appearing at a particular position in said second pattern.

4,532,651

DATA FILTER AND COMPRESSION APPARATUS AND METHOD

William B. Pennebaker, Jr., Carmel, and Keith S. Pennington, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,658
Int. Cl.[3] G06K 9/36
U.S. Cl. 382—54 7 Claims



1. In an image processing system including a grey scale filter apparatus, a method for filtering grey scale image data, wherein each picture element in a line of said image is represented by a binary signal containing at least two bits, one of said bits being a most significant bit and another of said bits being a least significant bit, comprising the steps of:

comparing in a first logic network, the most significant bit of a current picture element with the most significant bit of a previous picture element and the most significant bit of a subsequent picture element in the same line;

changing, in a second logic network, the value of the least significant bit of said current picture element in response to the most significant bit of each of said current picture element, said previous picture element and said subsequent picture element having the same binary value, and the least significant bit and the most significant bit of the current picture element having a different binary value.

4,532,652

PLASTIC BAG WITH AIR EXHAUSTION VALVE

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 16, 1983, Ser. No. 552,520
Int. Cl.[3] B65D 27/20
U.S. Cl. 383—103 4 Claims

1. A flexible bag having a closure comprising:

a flexible plastic film defining said bag;

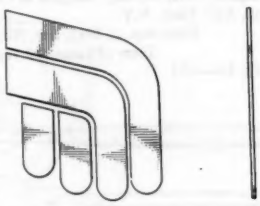
a means for closing and air-tightly sealing said bag and comprising a pair of cooperating reclosable engaging members respectively provided on opposing inner surfaces of said film and extending along a closable opening in said bag; and

a one-way air valve for exhausting air from said bag when sealed, said air valve comprising at least one backing member formed by an extending integral portion of one of said engaging members and adhered to an inner surface of said film, and at least one venting hole provided in said film and overlying said at least one backing member, said at least one backing member being adhered to said film except at overlying regions of said film surrounding said at least one venting hole.

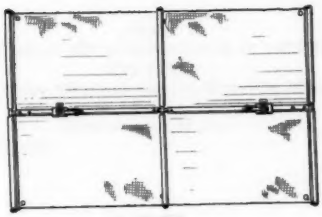
279,830
TROUSERS
David M. Setzler, 312 Eichelberger, St. Louis, Mo. 63111
Filed Mar. 25, 1983, Ser. No. 478,648
Term of patent 14 years
U.S. Cl. D2—28

279,831
DRESS
Anne Hensel, New York, N.Y., assignor to Joseph Love, Inc., New York, N.Y.
Filed Apr. 1, 1983, Ser. No. 481,395
Term of patent 14 years
U.S. Cl. D2—49

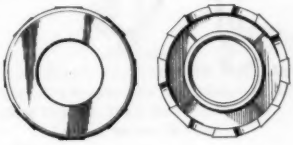
279,832
STRIP ARRANGEMENT FOR GLOVES
Robert B. Haro, Torrance, Calif., assignor to Haro Designs Inc., Carlsbad, Calif.
Filed Nov. 13, 1981, Ser. No. 320,857
Term of patent 14 years
U.S. Cl. D2—377

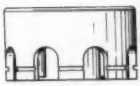


279,833
PORTABLE CANOPY FOR CAMP OR PICNIC TABLE
John J. Eberle, 1135 Austin Way, Napa, Calif. 94558
Filed Sep. 29, 1982, Ser. No. 426,992
Term of patent 14 years
U.S. Cl. D3—5



279,834
UMBRELLA RUNNER
Douglas Falzett, 15 Crystal Cove, Laguna Beach, Calif. 92651
Filed Oct. 24, 1983, Ser. No. 544,527
Term of patent 14 years
U.S. Cl. D3—10



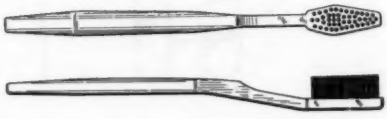


279,835
ELASTIC CAP FOR KNITTING NEEDLES
Yoshiaki Gakiya, Habikino, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Jun. 28, 1983, Ser. No. 508,516
Term of patent 14 years
U.S. Cl. D3—28

279,836
BOTTLE HOLDER FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,865
Term of patent years
U.S. Cl. D3—40

279,837
BOTTLE TRAY FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,858
Term of patent 14 years
U.S. Cl. D3—40

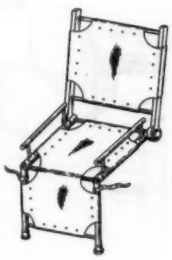
279,838
TOOTHBRUSH
Lars Hjelle, Oslo, Norway, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Sep. 2, 1983, Ser. No. 528,912
Term of patent 14 years
U.S. Cl. D4—104



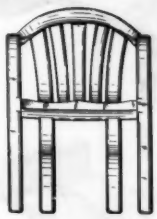
279,839
CHAIR
George C. Mulhauser, Paramus, N.J., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 11, 1983, Ser. No. 483,868
Term of patent 14 years
U.S. Cl. D6—365

279,840
SEAT
Jacques S. Guillon, 501 Landsdowne Ave., Westmount, Quebec, Canada H3Y 2V4
Filed May 17, 1982, Ser. No. 378,987
Term of patent 14 years
U.S. Cl. D6—334

279,841
ADJUSTABLE PATIENT'S CHAIR FOR USE PRIMARILY ON A HOSPITAL BED
Andrew J. Edmondson, 220 Engert Rd., Knoxville, Tenn. 37922, and E. Bud Edmondson, No. 3 Bedford Cir., Longview, Tex. 75601
Filed Apr. 5, 1983, Ser. No. 482,329
Term of patent 14 years
U.S. Cl. D6—367



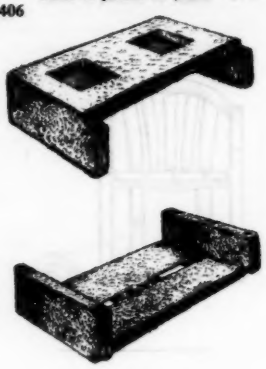
279,842
CHAIR
Kenneth Walker, 440 E. 56th St., New York, N.Y. 10022
Filed Jun. 9, 1983, Ser. No. 502,616
Term of patent 14 years
U.S. Cl. D6—370



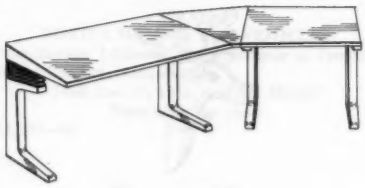
279,843
ANIMAL HEAD ATTACHMENT FOR PLANTERS OR THE LIKE
Patricia Y. Dolan, 401 Brandywine Dr., Burnsville, Minn. 55337
Filed Dec. 20, 1983, Ser. No. 563,600
Term of patent 14 years
U.S. Cl. D6—404

279,844
ANIMAL BODY PLANTER OR THE LIKE
Patricia Y. Dolan, 401 Brandywine Dr., Burnsville, Minn. 55337
Filed Dec. 20, 1983, Ser. No. 563,604
Term of patent 14 years
U.S. Cl. D6—404

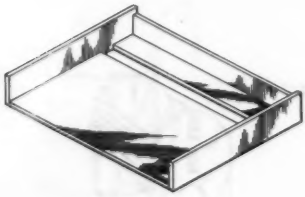
279,845
TRAY FOR HOLDING VIDEO GAME CONTROLLERS
Deloris J. Holliman, 330 NW. Jill Ann Dr., Burleson, Tex. 76028
Filed Mar. 28, 1983, Ser. No. 479,658
Term of patent 14 years
U.S. Cl. D6—406



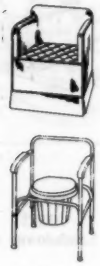
279,846
WORKTABLE UNIT OR SIMILAR ARTICLE
Hartmut H. Esslinger, Altensteig, Fed. Rep. of Germany, assignor to Konig & Neurath Kommanditgesellschaft, Fed. Rep. of Germany
Filed Feb. 10, 1983, Ser. No. 465,499
Term of patent 14 years
U.S. Cl. D6—483



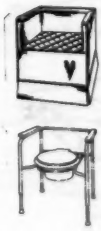
279,847
TRAY MODULE FOR USE WITH COMPUTER HARDWARE
Kenneth P. Hanover, Cordova, Tenn., assignor to McMorris & Associates, Inc., Atlanta, Ga.
Filed Jan. 27, 1983, Ser. No. 461,486
Term of patent 14 years
U.S. Cl. D6—510



279,848
COVER FOR BEDSIDE COMMODE
Anna Y. Kusiak, 152 S. Main St., Plains, Pa. 18705
Filed Jun. 20, 1983, Ser. No. 506,341
Term of patent 14 years
U.S. Cl. D6—610

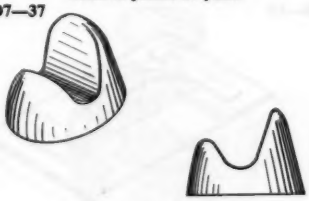


279,849
COVER FOR BEDSIDE COMMODE
Anna Y. Kusiak, 152 S. Main St., Plains, Pa. 18705
Filed Jun. 20, 1983, Ser. No. 506,342
Term of patent 14 years
U.S. Cl. D6—610



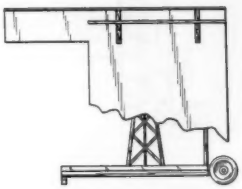
279,850
COMBINED CUP AND COASTER BASE
John H. Brooker, and Herbert A. Brooker, both of Scarborough, Canada, assignors to Bertwood Marketing Inc., Ontario, Canada
Filed Dec. 15, 1982, Ser. No. 449,862
Claims priority, application Canada, Jun. 23, 1982, 23-06-82-3
Term of patent 14 years
U.S. Cl. D7—3

279,851
TACO HOLDER
Michael A. Willis, 17602 Norwalk Blvd., Artesia, Calif. 90701
Filed Oct. 14, 1980, Ser. No. 196,545
Term of patent 14 years
U.S. Cl. D7—37

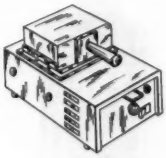


279,852
YOKED CHOP STICKS
Chester L. Yokoyama, 21 Woodland, Irvine, Calif. 92714
Filed Feb. 22, 1983, Ser. No. 468,338
Term of patent 14 years
U.S. Cl. D7—105

279,853
BARBECUE GRILL
Bert Hamilton, Jr., 8001 NW. 31st Ter., Bethany, Okla. 73008
Filed Dec. 27, 1983, Ser. No. 565,660
Term of patent 14 years
U.S. Cl. D7—334

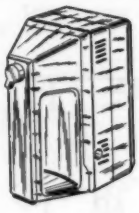


279,854
FOOD STEAMER
Dye O. Miller, Mount Prospect; August J. Antunes, Elmhurst, and Jerome Antunes, Clarendon Hills, all of Ill., assignors to A. J. Antunes & Company, Addison, Ill.
Filed Dec. 6, 1982, Ser. No. 447,494
Term of patent 14 years
U.S. Cl. D7—361



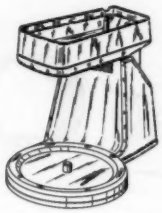
279,855
MOTOR BLOCK-WALLHOLDER UNIT
Marten F. Elkerbout, Peize, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 10, 1983, Ser. No. 456,943
Claims priority, application Benelux, Jul. 13, 1982, 57015-05
Term of patent 14 years
U.S. Cl. D7—376

279,856
MIXER FOR A KITCHEN MACHINE
Marten F. Elkerbout, Peize, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 10, 1983, Ser. No. 456,944
Claims priority, application Benelux, Jul. 13, 1982, 57015-04
Term of patent 14 years
U.S. Cl. D7—379



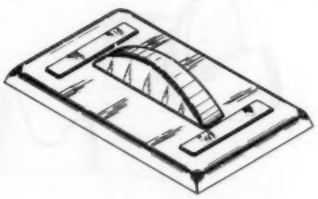
279,857
MOTOR BLOCK FOR A KITCHEN MACHINE BASE UNIT
Marten F. Elkerbout, Peize, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 10, 1983, Ser. No. 456,945
Claims priority, application Benelux, Jul. 13, 1982, 57015-03
Term of patent 14 years
U.S. Cl. D7—386

279,858
MIXER STAND
Wilhelmus Gerardus E. Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1983, Ser. No. 469,534
Claims priority, application Benelux, Sep. 2, 1982, 57123-00
Term of patent 14 years
U.S. Cl. D7—412



279,859
GRILL HOOK
Harold E. Faust, 4833 Holton Ave., Fort Wayne, Ind. 46806
Filed Jun. 29, 1981, Ser. No. 278,983
Term of patent 14 years
U.S. Cl. D8—14

279,860
PAINT SHIELD FOR ELECTRICAL OUTLET
Willard L. Schwalbe, 2203 Westport Dr. #3, Anaheim, Calif. 92806
Filed Apr. 26, 1982, Ser. No. 371,835
Term of patent 14 years
U.S. Cl. D8—14

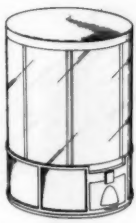


279,861
TOP OPENER
Nathan D. Hoskins, 6 Maywood Dr., Jackson, Tenn. 38301
Filed Apr. 8, 1983, Ser. No. 485,463
Term of patent 14 years
U.S. Cl. D8—39

279,862
ELECTRIC DRILL
Yoshiyuki Sato, Fuchu, and Kiyoshi Hoshino, Tokyo, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Aug. 30, 1983, Ser. No. 527,663
Claims priority, application Japan, Mar. 18, 1983, 58-11499
Term of patent 14 years
U.S. Cl. D8—61

279,863
COMBINED BOTTLE AND CLOSURE
Alain Carre, Paris, France, assignor to Parfums Guy Laroche, Societe Anonyme, France
Filed May 21, 1982, Ser. No. 380,685
Term of patent 14 years
U.S. Cl. D9—336

279,864
VITAMIN PILL DISPENSER
Brad J. Ridgley, 1610 California St., Apt. B, Santa Monica, Calif. 90403
Filed Jul. 19, 1982, Ser. No. 399,775
Term of patent 14 years
U.S. Cl. D9—341

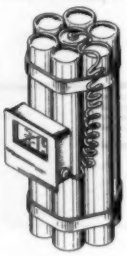


279,865
COMMUNION PACK
Helen R. McKee, 2 Arcade Cir., Las Vegas, Nev. 89110
Filed Dec. 13, 1982, Ser. No. 449,408
Term of patent 14 years
U.S. Cl. D9—347

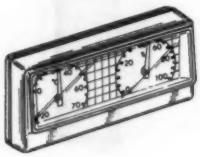
279,866
DISPENSER FOR FLOWABLE PRODUCTS
Joachim Czech, Jahnstrasse 19, D-8405 Donaustauf, Fed. Rep. of Germany
Filed Feb. 8, 1982, Ser. No. 346,897
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 16AR1793/81
Term of patent 14 years
U.S. Cl. D9—366

279,867
GLAZING COMPOUND DISPENSING SPOUT
Joseph Marg, Cleveland, Ohio, assignor to Stay-Tite Products, Cleveland, Ohio
Filed Jan. 14, 1983, Ser. No. 458,174
Term of patent 14 years
U.S. Cl. D9—442

279,868
DIGITAL CLOCK
Michael W. Boffo, 8334 E. Frye Rd., Indianapolis, Ind. 46259
Filed May 31, 1983, Ser. No. 499,504
Term of patent 14 years
U.S. Cl. D10—6



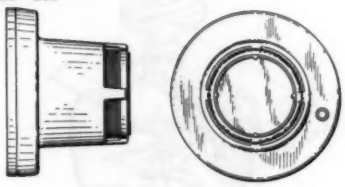
279,869
COMBINED THERMOMETER-HYGROMETER FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,851
Term of patent 14 years
U.S. Cl. D10—53



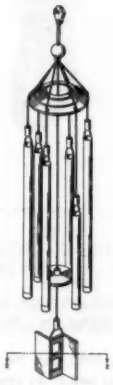
279,870
SAW GUIDE
Richard C. Wilson, Champlin, Minn., assignor to Tie Down Engineering, Inc., Atlanta, Ga.
Filed Mar. 7, 1983, Ser. No. 473,025
Term of patent 14 years
U.S. Cl. D10—62

279,871
INFRARED INTRUSION DETECTOR SYSTEM HOUSING
John K. Guscott, Lynnfield; Kenneth E. Beeson, Waltham; Hugh D. Dyer, Norton; George Vuigaris, Quincy, and H. Patrick Thornton, Acton, all of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Jun. 14, 1983, Ser. No. 504,279
Term of patent 14 years
U.S. Cl. D10—106

279,872
PHOTOELECTRIC SMOKE DETECTOR
Hugh P. Thornton, Jr., Acton, and Robert B. Powers, Norwell, both of Mass., assignors to American District Telegraph Company, Jersey City, N.J.
Filed Aug. 22, 1983, Ser. No. 524,874
Term of patent 14 years
U.S. Cl. D10—106



279,873
MUSICAL WIND CHIME
Olin H. Neely, 1141 Patricia Dr., Bossier, La. 71112
Filed Aug. 18, 1983, Ser. No. 524,734
Term of patent 14 years
U.S. Cl. D10—116



279,874
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,349
Term of patent 14 years
U.S. Cl. D11—43

279,875
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,351
Term of patent 14 years
U.S. Cl. D11—43

279,876
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,352
Term of patent 14 years
U.S. Cl. D11—43

279,877
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,354
Term of patent 14 years
U.S. Cl. D11—43

279,878
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,559
Term of patent 14 years
U.S. Cl. D11—43

279,879
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,560
Term of patent 14 years
U.S. Cl. D11—43

279,880
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,561
Term of patent 14 years
U.S. Cl. D11—43

279,881
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,350
Term of patent 14 years
U.S. Cl. D11—45

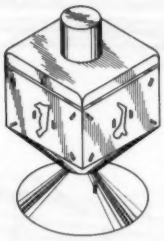
279,882
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,556
Term of patent 14 years
U.S. Cl. D11—45

279,883
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,557
Term of patent 14 years
U.S. Cl. D11—45

279,884
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,558
Term of patent 14 years
U.S. Cl. D11—45

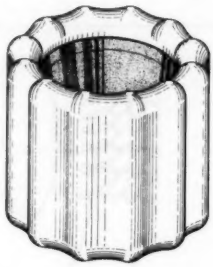
279,885
EARRING OR THE LIKE
Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748
Filed Nov. 3, 1983, Ser. No. 548,562
Term of patent 14 years
U.S. Cl. D11—45

279,886
DREDEL ORNAMENT
Marlene A. B. Soifer, 229 N. York Rd., Hatboro, Pa. 19040
Filed May 4, 1982, Ser. No. 374,678
Term of patent 14 years
U.S. Cl. D11—121



279,887
CHRISTMAS TREE STAND
Wade D. Sumpter, 1715 S. Main, McAlester, Okla. 74501
Filed May 4, 1983, Ser. No. 491,362
Term of patent 14 years
U.S. Cl. D11—130.1

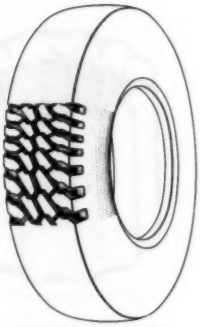
279,888
PLANTER
Walter Zeischegg, Turmstr. 43, Neu-Ulm, Fed. Rep. of Germany (7910), and Bernd Brüssing, Bilharzstr. 3, Ulm-Donau, Fed. Rep. of Germany (7900)
Filed Jan. 27, 1983, Ser. No. 461,507
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, MR 970
Term of patent 14 years
U.S. Cl. D11—152



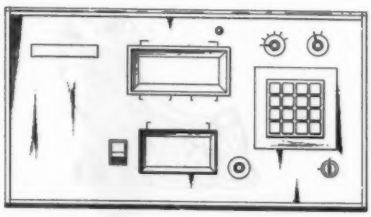
279,889
FIGURINE OF A TREE FROG
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 21, 1981, Ser. No. 303,994
Term of patent 14 years
U.S. Cl. D11—158

279,890
VEHICLE TIRE
Haruo Kusube, Toyota, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 15, 1983, Ser. No. 485,298
Term of patent 14 years
U.S. Cl. D12—146

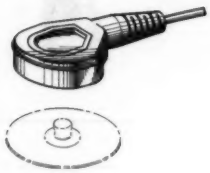
279,891
TIRE
John D. German, Hartville, and Donald J. Sladky, Cuyahoga Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed May 20, 1983, Ser. No. 496,720
Term of patent 14 years
U.S. Cl. D12—146



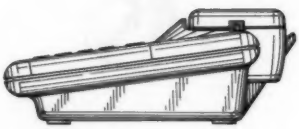
279,892
INSTRUMENT FACE PANEL
Reid E. Brockway, King County, Wash., assignor to Novatech Research Corporation, Bellevue, Wash.
Filed May 25, 1983, Ser. No. 497,800
Term of patent 14 years
U.S. Cl. D13—12



279,893
ELECTRICAL CONNECTOR
James M. Tantillo, Brockton, and Edward L. Boulanger, West Bridgewater, both of Mass., assignors to Component Manufacturing Service, Inc., W. Bridgewater, Mass.
Filed Jun. 30, 1983, Ser. No. 509,306
Term of patent 14 years
U.S. Cl. D13—24

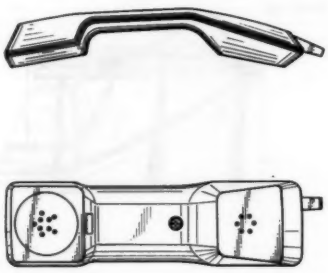


279,894
TELEPHONE
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Sidcup, England
Filed Oct. 21, 1982, Ser. No. 435,867
Claims priority, application United Kingdom, Apr. 21, 1982, 1006302
Term of patent 14 years
U.S. Cl. D14—53

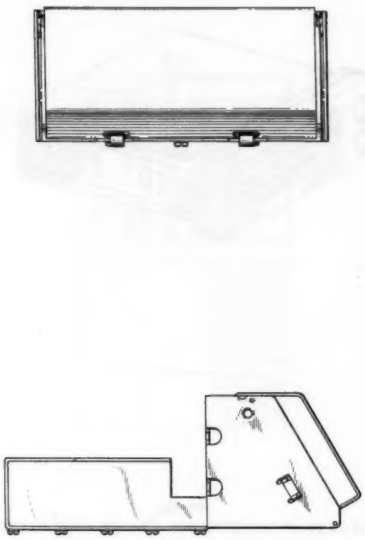


279,895
TELEPHONE
Laurent J. Menei, Aville, France, assignor to Thomson-CSF Telephone, Colombes, France
Filed Nov. 12, 1982, Ser. No. 441,121
Claims priority, application France, May 12, 1982, 821,667
Term of patent 14 years
U.S. Cl. D14—53

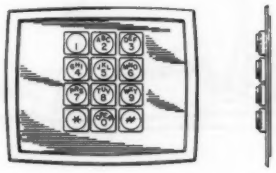
279,896
TELEPHONE HANDSET
Hiroshi Inaba, Yokohama, Japan, assignor to Nippon Tsushin Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Apr. 29, 1983, Ser. No. 490,146
Claims priority, application Japan, Feb. 1, 1983, 58-3330
Term of patent 14 years
U.S. Cl. D14—63



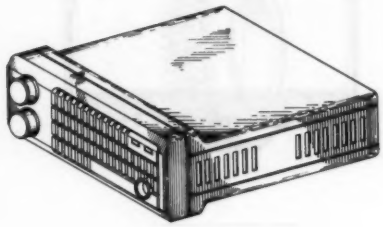
279,897
TELEPHONE BRIDGE LIFTER BLOCK
Helmuth Neuwirth, Garden City, N.Y., and George S. Rubio, West Covina, Calif., assignors to Porta Systems Corp., Syosset, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,862
Term of patent 14 years
U.S. Cl. D14—59



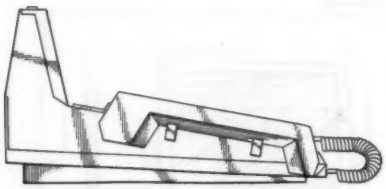
279,898
TELEPHONE COVER DEVICE
Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.
Filed Feb. 23, 1981, Ser. No. 236,760
Term of patent 14 years
U.S. Cl. D14—66



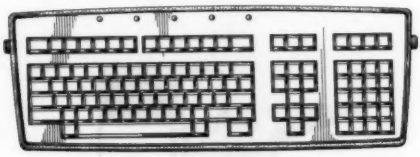
279,899
VEHICULAR TWO-WAY RADIO OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed May 26, 1983, Ser. No. 498,389
Term of patent 14 years
U.S. Cl. D14—68



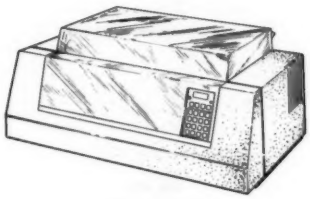
279,900
COMBINATION TELEPHONE, CLOCK AND RADIO SET
David Topp, Miami, Fla., assignor to Multi-tech Industries Corp., Miami, Fla.
Continuation-in-part of Ser. No. 601,965, Apr. 19, 1984,. This application Jul. 6, 1984, Ser. No. 628,601
Term of patent 14 years
U.S. Cl. D14—73



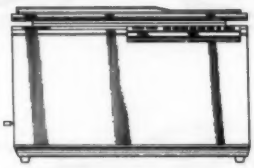
279,901
LOW PROFILE KEYBOARD OR SIMILAR ARTICLE
Richard R. Dillon, Wellesley, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.
Filed Mar. 23, 1983, Ser. No. 478,177
Term of patent 14 years
U.S. Cl. D14—100



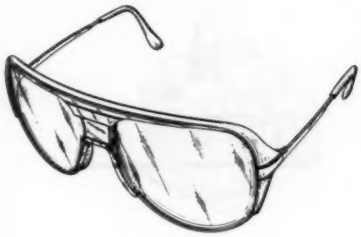
279,902
PRINTER CABINET
Donald M. Genaro, Haworth; Alvin R. Tilley, Red Bank, both of N.J.; Edwin D. McQueen, Barrington, Ill.; Joseph G. Murglin, Norridge, Ill.; James E. Oneby, North Lake, Ill., and Robert J. Ramig, Jr., Niles, Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.
Filed Nov. 22, 1982, Ser. No. 443,810
Term of patent 14 years
U.S. Cl. D14—111



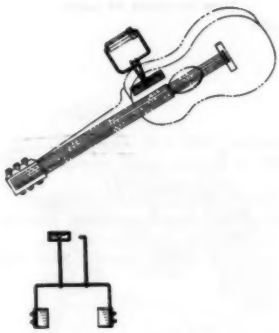
279,903
ELECTRONIC COPYING MACHINE
Mikio Kosako; Hiroshi Nishibori, and Harumi Fukuda, all o Osaka, Japan, assignors to Sharp Corporation, Osaka, Japa
Filed Jul. 22, 1983, Ser. No. 517,240
Claims priority, application Japan, Jan. 24, 1983, 58-2482
Term of patent 14 years
U.S. Cl. D16—31



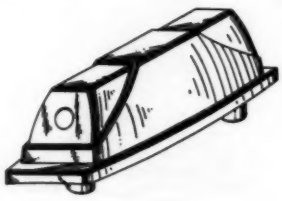
279,904
EYEGLASSES
Luciano Pulie, Belluno, Italy, assignor to Marcolin SPA, Vallessella di Cadore, Italy
Filed Dec. 22, 1982, Ser. No. 452,091
Term of patent 14 years
U.S. Cl. D16—102



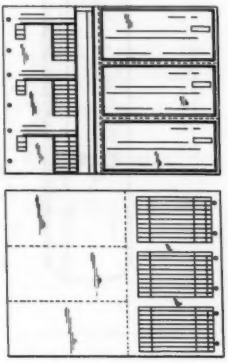
279,905
HARMONICA HOLDER
Earl B. Whited, R.R. #2, Box 146, Rushville, Ill. 62681
Filed May 12, 1983, Ser. No. 493,810
Term of patent 14 years
U.S. Cl. D17—13



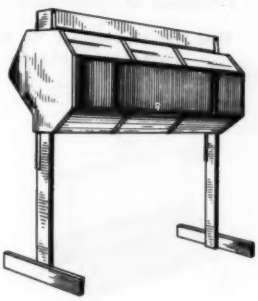
279,906
DRUM LUG
Roger B. Ireland, Simsbury, Conn., assignor to C. Bruno & Son, Inc., Bloomfield, Conn.
Filed Apr. 28, 1983, Ser. No. 489,544
Term of patent 14 years
U.S. Cl. D17—22



279,907
COMBINED CHECKS AND CHECK STUBS
John L. Bateman, Cockeysville, Md., assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 332,280, Dec. 18, 1981, Pat. No. Des. 276,821. This application Sep. 6, 1984, Ser. No. 647,786
Term of patent 14 years
U.S. Cl. D19—11



279,908
CIGARETTE PACK MERCHANDISING UNIT
Lee Wiese, Upper Nyack, N.Y., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Feb. 8, 1983, Ser. No. 464,607
Term of patent 14 years
U.S. Cl. D20—4

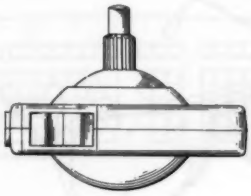


279,909
VISUAL ORIENTATION DEVICE FOR PEDESTRIANS
Henry H. Huston, P.O. Box 1034, Burlington, Vt. 05402
Filed Sep. 9, 1982, Ser. No. 416,178
Term of patent 14 years
U.S. Cl. D20—10

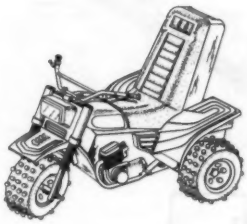
279,910
AUDIO RESPONSIVE LIGHT DISPLAY BADGE
David G. Detro, Costa Mesa, Calif., assignor to Solid State Artworks, Inc., Santa Ana, Calif.
Filed Jun. 13, 1983, Ser. No. 503,615
Term of patent 14 years
U.S. Cl. D20—28

279,911
REBOUND BALL GAME NET
Richard B. Thompson, 264 Beverly Hills Rd., Fort Lee, N.J. 07024
Filed Mar. 10, 1983, Ser. No. 474,168
Term of patent 14 years
U.S. Cl. D21—5

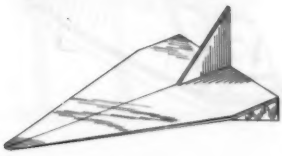
279,912
HAND OPERATED CONTROL UNIT FOR VIDEO GAMES
Hugh M. Lee, San Jose, Calif., assignor to Amiga Corporation, Santa Clara, Calif.
Filed Feb. 7, 1983, Ser. No. 464,312
Term of patent 14 years
U.S. Cl. D21—48



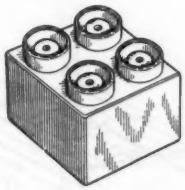
279,913
TOY MOTORCYCLE
Yukimitsu Matsushiro, Tokyo, Japan, assignor to Kabushiki Kaisha Matsushiro, Tokyo, Japan
Filed Sep. 30, 1982, Ser. No. 432,381
Claims priority, application Japan, Jul. 16, 1982, 57-032185
Term of patent 14 years
U.S. Cl. D21—80



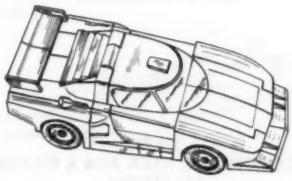
279,914
TOY GLIDER
John J. Solomon, Jr., 83 Beaufort St., Providence, R.I. 02908
Filed Oct. 24, 1983, Ser. No. 545,733
Term of patent 14 years
U.S. Cl. D21—89

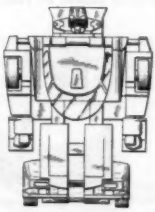


279,915
TOY CONSTRUCTION PIECE
Jose Mª Arnau Pibet, Barcelona, Spain, assignor to Exin-Lines Bros, S.A., Spain
Filed Oct. 7, 1982, Ser. No. 433,364
Claims priority, application Spain, Apr. 7, 1982, 101,612
Term of patent 14 years
U.S. Cl. D21—108

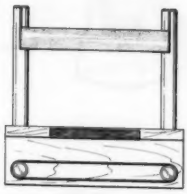


279,916
RECONFIGURABLE TOY VEHICLE
Hiroyuki Obara, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1984, Ser. No. 587,362
Claims priority, application Japan, Sep. 20, 1983, 58-40857
Term of patent 14 years
U.S. Cl. D21—136



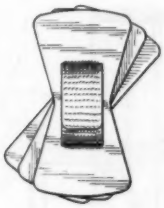


279,917
SIT-UP EXERCISE DEVICE
Robert W. Hill, 2S400 Burning Trail, Wheaton, Ill. 60187
Filed Nov. 4, 1983, Ser. No. 548,713
Term of patent 14 years
U.S. Cl. D21—191



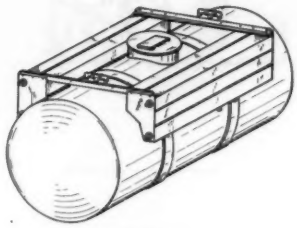
279,918
PHYSICAL EXERCISER
Paul D. Stumbaugh, 115 S. Oklahoma, Mangum, Okla. 73554, and Dallas A. Thompson, 424 W. Eula, Hollis, Okla. 73550
Filed Nov. 28, 1983, Ser. No. 555,753
Term of patent 14 years
U.S. Cl. D21—194

279,919
AQUATIC EXERCISING DEVICE
Douglas H. Bedgood, P.O. Box 1820, Idyllwild, Calif. 92349, assignor to Douglas H. Bedgood, Cherokee, N.C.
Filed Apr. 1, 1983, Ser. No. 481,307
Term of patent 14 years
U.S. Cl. D21—198

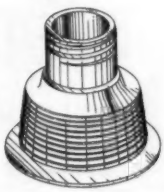


279,920
BODY FOR A SLED-LIKE SPORTS VEHICLE
Gene K. Gardinier, 1125 Shattuck Ave., Berkeley, Calif. 94709, and Alan T. Roberts, 2031 Parker St., Berkeley, Calif. 94704
Filed Dec. 16, 1982, Ser. No. 450,334
Term of patent 14 years
U.S. Cl. D21—227

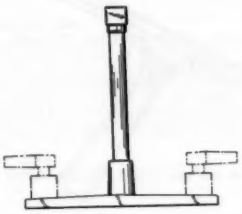
279,921
WASHDOWN SPRAYER TANK
John E. Blumer; Richard J. Ehmke, and Arthur F. Linsenmeyer, all of Beatrice, Nebr., assignors to Dempster Industries Inc., Beatrice, Nebr.
Filed Aug. 27, 1982, Ser. No. 412,160
Term of patent 14 years
U.S. Cl. D23—2



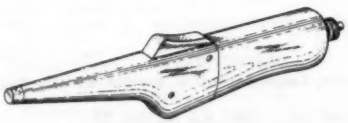
279,922
TELESCOPING FILL NECK FOR A WATERBED MATTRESS
Anthony J. Bova, 1133 N. Broadway, Stockton, Calif. 95205
Filed Dec. 6, 1982, Ser. No. 447,383
Term of patent 14 years
U.S. Cl. D23—27



279,923
COMBINED BASE AND SPOUT FOR A SANITARY FITTING OR SIMILAR ARTICLE
James E. Niemann, Louisville, Ky., and Henry M. Stairs, Jr., Neshanic, N.J., assignors to American Standard Inc., New York, N.Y.
Filed Jun. 1, 1982, Ser. No. 383,913
Term of patent 14 years
U.S. Cl. D23—32

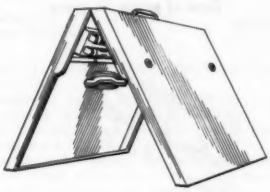


279,924
HAND HELD BIDET
Robert W. Osgood, 2873 Gladstone La., Shingle Springs, Calif. 95682
Filed Sep. 27, 1982, Ser. No. 424,200
Term of patent 14 years
U.S. Cl. D23—51

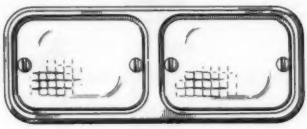


279,925
SUCTION TUBE HANDLE WITH VALVE
Lewis A. Wise, 509 Seventeenth St., Santa Monica, Calif. 90402
Filed Jul. 15, 1982, Ser. No. 398,617
Term of patent 14 years
U.S. Cl. D24—53

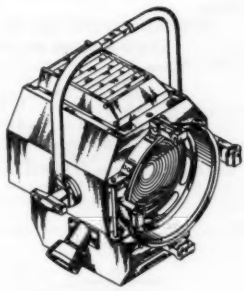
279,926
PORTABLE INFANT PHOTOTHERAPY LIGHT
Richard J. Rosenbaum, 1621 Dover Rd., Montrose, Colo. 81401
Filed Jan. 21, 1983, Ser. No. 446,365
Term of patent 14 years
U.S. Cl. D24—68



279,927
PANEL OR FLUSH MOUNTABLE VEHICULAR LIGHT FIXTURE
James M. Preisler, Mound, and Alwin J. Stahel, St. Paul, both of Minn., assignors to Drag Specialties, Inc., Minnetonka, Minn.
Filed Aug. 29, 1983, Ser. No. 527,128
Term of patent 14 years
U.S. Cl. D26—35

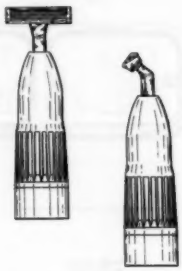


279,928
FRESNEL SPOTLIGHT
Ira G. McNabb, San Gabriel; Denis G. Wolfe, Agoura, and Robert G. Fischette, Panorama City, all of Calif., assignors to Colortran, Inc., Burbank, Calif.
Filed Oct. 1, 1982, Ser. No. 432,208
Term of patent 14 years
U.S. Cl. D26—63

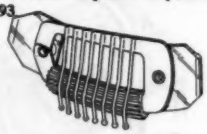


279,929
PAIR OF AUTOMOBILE REAR LENSES
Richard A. Teague, Franklin; Robert C. Nixon; George M. Krispinsky, both of Huntington Woods; Jack E. Kenitz, New Baltimore, and Gary D. Guichard, Dearborn Heights, all of Mich., assignors to American Motors Corporation, Southfield, Mich.
Filed Sep. 30, 1982, Ser. No. 432,151
Term of patent 14 years
U.S. Cl. D26—122

279,930
VIBRATING SHAVER
Jimmy George, Mer Rouge, La., assignor to The Phillips Corporation, Little Rock, Ark.
Filed Sep. 15, 1983, Ser. No. 532,403
Term of patent 14 years
U.S. Cl. D28—49

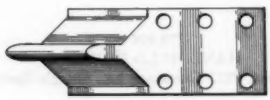


279,931
WIG ANCHOR
Nobuo Nemoto, Chofu, Japan, assignor to Aderans Company Ltd., Japan
Filed Apr. 11, 1983, Ser. No. 483,707
Term of patent 14 years
U.S. Cl. D28—93



279,932
WINDOW CLEANER
Arne Bergström, Nottebäck, Sweden, assignor to Swish AB, Solna, Sweden
Filed Mar. 2, 1981, Ser. No. 239,691
Claims priority, application Sweden, Nov. 17, 1980, 80-2282
Term of patent 14 years
U.S. Cl. D32—41

279,933
CONFORM SCRAPER TOOL
Mark Gaines, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.
Filed Oct. 13, 1982, Ser. No. 434,160
Term of patent 14 years
U.S. Cl. D32—46



279,934
DEPOSIT RACK
Albert S. Eriksson, Långåkersgatan 16, S-442 00 Kungälv, Sweden
Filed Dec. 3, 1982, Ser. No. 446,785
Claims priority, application Sweden, Jun. 18, 1982, 82-1615
Term of patent 14 years
U.S. Cl. D99—34

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PATENTS WERE ISSUED ON THE 30TH DAY OF JULY, 1985

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Baker, Jay S., to Ampex Corporation. Predistortion circuit. 4,532,604, Cl. 364-851.000.

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Fineberg, Douglas H., 4,531,587, Cl. 166-332.000.
Kim, Yung J., 4,531,552, Cl. 138-149.000.
Muse, John F.; Riddle, Harry W.; Zeiler, Frank S.; and Buruato, Juventino, 4,531,582, Cl. 166-241.000.
Peterson, Elmer R., 4,531,590, Cl. 175-4.520.

Baker, Stephen R.; Lindstrom, Terry D.; Jamieson, William B.; and Ross, William J., to Lilly Industries Limited. Certain aurones and their use in the treatment of allergies. 4,532,257, Cl. 514-470.000.

Bakermans, Johannes C. W., to AMP Incorporated. Modular unit assembly machine. 4,531,280, Cl. 29-564.600.

Balanky, Michael F. Protective cover for vehicles. 4,531,560, Cl. 150-52.00K.

Balboni, Francis H. Snow removal implement. 4,531,713, Cl. 254-131.500.

Balchunis, Robert J.; and Sher, Frank T., to Minnesota Mining and Manufacturing Company. Antistatic films. 4,532,185, Cl. 428-447.000.

Balkwill, John T., to Varian Associates, Inc. Multifiber design for microchannel plates. 4,532,171, Cl. 428-188.000.

Balle, Gerhard: *See*—
Rasshofer, Werner; Balle, Gerhard; Dieterich, Dieter; and Meyborg, Holger, 4,532,266, Cl. 521-159.000.

Ballheimer, Benny: *See*—
Amdall, John K.; and Ballheimer, Benny, 4,531,746, Cl. 277-53.000.

Ballinger, Dale O., to Biosound, Inc. Phased array for an ultrasonic transducer. 4,532,615, Cl. 367-87.000.

Ballmer, Horst, to Carl-Zeiss-Stiftung. Method and apparatus for temporarily increasing the absorptance of optical transmitting components. 4,531,814, Cl. 350-355.000.

Ballocca, Guido; and Azzola, Roberto, to S.A.I.A.G. S.p.A. Extruded weather strip for motor vehicle bodies and an extrusion head for forming the weather strip. 4,531,326, Cl. 49-497.000.

Bally, Diego, to Markus Grass. Adapter for arranging an instant picture cassette at a 35 mm camera and method for manufacturing the same. 4,531,818, Cl. 354-83.000.

Balmer, Oskar: *See*—
Focke, Heinz; and Balmer, Oskar, 4,531,597, Cl. 177-84.000.

Balschi, James A.: *See*—
Springer, Charles S., Jr.; Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., 4,532,217, Cl. 436-79.000.

Banas, Kenneth P.: *See*—
Fox, James W.; Moery, Ronald J.; and Banas, Kenneth P., 4,532,394, Cl. 200-275.000.

Barajas, Felix, to McDonnell Douglas Corporation. Solder composition. 4,531,986, Cl. 148-24.000.

Barbagli, Rino O., to Fiatallis Europe, S.p.A. Device for correcting deviations from rectilinear movement of tracked vehicles having separate transmissions for right and left side tracks. 4,531,601, Cl. 180-6.480.

Barker, Michael D.: *See*—
Martin, Derek J.; and Barker, Michael D., 4,531,617, Cl. 187-89.000.

Barlier, Pernette R. M.; Boury, Gerard R.; and Mazeau, Jean-Pierre, to Corning Glass Works. Decorative enamel for glass-ceramics having low coefficients of thermal expansion. 4,532,221, Cl. 501-22.000.

Barlier, Pernette R. M.; and Mazeau, Jean-Pierre, to Corning Glass Works. Tinted opal glasses. 4,532,223, Cl. 501-32.000.

Barnes, Philip E., to United Technologies Corporation. Balanced output hydraulic actuator system. 4,531,448, Cl. 91-384.000.

Barnett, Allan E.; and Halluin, Albert P., to Exxon Research and Engineering Co. Process for hydrogenating organic compounds by use of Group VIII aluminum-silicate catalysts. 4,532,351, Cl. 564-415.000.

Barnett, Eugene R. Deep sea oil salvage means. 4,531,860, Cl. 405-60.000.

Barr, John A.: *See*—
Thomas, Gerald S.; Punshon, John; and Barr, John A., 4,531,496, Cl. 123-495.000.

Barr, Michael E., to Deere & Company. Control spool valve. 4,531,546, Cl. 137-625.690.

Barre, Claude, to Siemens Aktiengesellschaft. Flip-flop in current mode logic controlled by a transfer clock with auxiliary current applied to differential amplifier. 4,532,440, Cl. 307-455.000.

Barry, Brian; and Freeman, Christopher, to Rolls-Royce Limited. Aerodynamic damping of vibrations in rotor blades. 4,531,362, Cl. 60-226.100.

Bartels, Wolfgang, to Rheinmetall GmbH. Barrel mount for cannon. 4,531,447, Cl. 89-37.700.

Barthez, Roland; Boissonnet, Francisque; and Bogo, Rene , to Compagnie Francaise de Raffinage. Bidirectional thermal syphon valve, installation for the production and storage of heat or cold comprising such a thermal syphon valve, and various uses. 4,531,510, Cl. 126-419.000.

BASF Aktiengesellschaft: *See*—
Buschmann, Ernst; Schulz, Guenter; Heilen, Gerd; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,532,234, Cl. 514-63.000.
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Rauben Heimer, Hans-Juergen, 4,532,320, Cl. 528-498.000.
Eckhardt, Heinz; Halbritter, Klaus; Goetz, Norbert; and Heilen, Gerd, 4,532,337, Cl. 549-425.000.
Lenz, Werner; Sander, Hans; and Moller, Dieter, 4,532,300, Cl. 525-124.000.
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,532,188, Cl. 428-500.000.
Toussaint, Herbert; and Pander, Hans J., 4,532,082, Cl. 260-465.100.

BASF Wyandotte Corporation: *See*—
Schmidt, Douglass N., 4,532,133, Cl. 514-725.000.

Basile, Philip C., to RCA Corporation. Switching circuit which is self-biased in one mode of operation. 4,532,433, Cl. 307-241.000.

Baski, Henry A. Method of manufacturing a pitless adapter. 4,531,664, Cl. 228-125.000.

Battelle Development Corporation: *See*—
Gardner, David L., 4,532,123, Cl. 424-21.000.
Reif, Robert B.; and Albrechtson, Loren R., 4,531,402, Cl. 73-28.000.
Reif, Robert B.; and Albrechtson, Loren R., 4,531,486, Cl. 123-198.0DC.

Bauchet, Bernard, to Sintra-Alcatel. Feed-through for hybrid circuit box and matching connectors. 4,531,791, Cl. 339-14.00R.

Bauer, Helmut: *See*—
Svoboda, Josef; Krob, Erwin; and Bauer, Helmut, 4,531,758, Cl. 280-628.000.

Bauer, Hermann: *See*—
Spielmann, Norbert; and Bauer, Hermann, 4,531,452, Cl. 92-168.000.

Baumann, Horst: *See*—
Schmid, Karl; Baumann, Horst; and Rommerskirchen, Hans J., 4,532,076, Cl. 252-557.000.

Baumgartel, Patrice, to Carl-Zeiss-Stiftung. Spacing safety mechanism for operation microscopes with electromotive stands. 4,531,816, Cl. 350-521.000.

Baumgartner, Hans: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Brandstadter, Manfred, 4,531,899, Cl. 418-59.000.

Baumgartner, Merzia: *See*—
Andreolla, Florian, 4,531,767, Cl. 285-220.000.

Baumgartner, Steven A.: *See*—
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., 4,532,098, Cl. 264-320.000.

Baur, Robert; Iversen, Ralph T.; and Stephenson, Roger C., to Automation Industries, Inc. Heavy-duty electrical connector. 4,531,798, Cl. 339-75.00M.

Baur, Robert, to Automation Industries, Inc. Plug and receptacle connector locking means. 4,531,801, Cl. 339-89.00M.

Bay, David L.: *See*—
Knoll, William C.; and Bay, David L., 4,532,456, Cl. 315-223.000.

Bayer Aktiengesellschaft: *See*—
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss,

Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.
Holmwood, Graham; Buchel, Karl H.; Lursen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,532,341, Cl. 549-559.000.
Ippen, Jakob; and Stuttgen, Friedel, 4,531,561, Cl. 152-510.000.
Jager, Horst, 4,532,323, Cl. 544-75.000.
Rasshofer, Werner; Balle, Gerhard; Dieterich, Dieter; and Meyborg, Holger, 4,532,266, Cl. 521-159.000.
Rasshofer, Werner, 4,532,317, Cl. 528-60.000.
Ritter, Helmut; Paulus, Wilfried; and Genth, Hermann, 4,532,259, Cl. 514-608.000.
Wingler, Frank, 4,532,277, Cl. 524-37.000.

BBC Brown, Boveri & Company, Limited: *See*—
Schminke, Wolfram, 4,532,483, Cl. 333-34.000.
Singer, Robert, 4,531,981, Cl. 148-11.50N.

Beach, Laurence R., Jr.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., to International Business Machines Corporation. Vacuum probe for attaching tape to reel hub within a cartridge. 4,531,689, Cl. 242-195.000.

Beals, Tom C. Load bearing security cover for pick up truck. 4,531,775, Cl. 296-100.000.

Beasom, James D., to Harris Corporation. Method of fabrication bipolar transistor with improved base collector breakdown voltage and collector series resistance. 4,532,003, Cl. 156-648.000.

Becht, Charles, IV, to Exxon Research and Engineering Co. Refractory gas distributor for fluidized bed reactors. 4,532,108, Cl. 422-143.000.

Bechtel, Daniel L. Scope-mounting devices for firearms. 4,531,321, Cl. 42-1 0ST.

Bechtle, Samuel J. Eye drop application aid. 4,531,944, Cl. 604-302.000.

Bedford Engineering Co.: *See*—
Bradley, William P., 4,531,993, Cl. 156-227.000.

Bedi, James J.; and Joshi, Madhusudan, to Ethicon, Inc. Two-piece tissue fastener with locking top and method for applying same. 4,531,522, Cl. 128-335.000.

Beel, Joseph W.: *See*—
Jonas, Rodger H.; Beel, Joseph W.; and Lynch, William R., 4,532,147, Cl. 426-655.000.

Begin, Ghislain: *See*—
Boillot, Jean-Paul; Begin, Ghislain; Alexandrov, N.; Fihey, Jean-Luc; Di Vincenzo, A.; and Villemure, Denis, 4,532,404, Cl. 219-124.340.

Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, to Olympia Werke AG. Optical printing head for line-by-line recording of picture and text information. 4,532,526, Cl. 346-107.00R.

Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, to Olympia Werke AG. Optical printing device. 4,532,527, Cl. 346-108.000.

Bele, Robert: *See*—
Prud'hon, Lucien; and Bele, Robert, 4,531,412, Cl. 73-621.000.

Bell & Howell Japan Ltd.: *See*—
Katsuyama, Tsutomu, 4,531,819, Cl. 354-92.000.

Bell, Russell A.: *See*—
Turner, John V.; and Bell, Russell A., 4,532,334, Cl. 549-297.000.

Bellafiore, Gaspare. Hearing aid. 4,532,649, Cl. 381-69.000.

Beloit Corporation: *See*—
Matthew, John B.; and Kirchner, Edward C., 4,531,681, Cl. 241-146.000.

Beltrand, Steven D.: *See*—
Jacobozzi, Vivian M.; and Beltrand, Steven D., 4,531,638, Cl. 206-486.000.

Beltz, Richard K.; and Large, Donald M., to AT&T Technologies, Inc. Assembling components having mating faces. 4,531,277, Cl. 29-466.000.

Benchimol, Jean-Louis; and Quillec, Maurice. Process for the liquid phase epitaxial deposition of a monocrystalline ternary compound. 4,532,001, Cl. 156-622.000.

Bendell, Sidney L.; and Johnson, Cydney A., to RCA Corporation. Exposure time control for a solid-state color camera. 4,532,550, Cl. 358-213.000.

Bendix Corporation, The: *See*—
Hendrickson, Richard T.; and Lohraff, Larry G., 4,531,370, Cl. 60-554.000.

Benefield, Robert E., Jr.: *See*—
Boultinghouse, Harold D.; Boeke, Paul J.; Benefield, Robert E., Jr.; and Leland, John, 4,532,015, Cl. 204-38.400.

Benhase, Craig, to Dexport Tool Company. Cutting tool. 4,531,867, Cl. 408-224.000.

Bennett, James R.: *See*—
Fuller, Oliver C.; Bennett, James R.; and Skeen, J. Hall, 4,531,666, Cl. 228-171.000.

Bennett, Phillip P., to Ampex Corporation. Video device synchronization system. 4,532,547, Cl. 358-148.000.

Berger, Jenson & Nicholson, Limited: *See*—
Salome, Frederik, 4,531,975, Cl. 106-18.300.

Berger, Saul H., to Grumman Aerospace Corporation. Hand glove. 4,531,241, Cl. 2-161.00R.

Bergler, Otto, to Eugen Lutz GmbH & Co. Maschinenfabrik. Combination table and miter saw. 4,531,441, Cl. 83-471.300.

Bernardi, A. L.: *See*—
Bullock, Wilbur W., 4,531,771, Cl. 294-104.000.

Bernarducci, Ernest: *See*—
Paszek, Leon E.; and Bernarducci, Ernest, 4,532,066, Cl. 252-144.000.

Bernstein, David H.: *See*—
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Bernt, Paul, to Siemens Aktiengesellschaft. Contact arrangement for vacuum switches. 4,532,391, Cl. 200-144.00B.

Berryessa, Richard, to Med-West, Incorporated. Cardioplegia/air aspiration cannula. 4,531,935, Cl. 604-45.000.

Berstein, Patrick. Transaction terminal with simplified data entry. 4,532,416, Cl. 235-379.000.

Bertaud, Yves: *See*—
Keinborg, Maurice; Varin, Philippe; Bertaud, Yves; and Leroy, Michel, 4,532,017, Cl. 204-67.000.

Bertrand, Pierre C.; and De Paepe, Thijlbert C., to Sereg, S.A. Measuring apparatus having a sensor located remotely from its electricity power supply. 4,532,510, Cl. 340-870.390.

Besser Company: *See*—
Wauhop, Billy J., Jr.; and Stratz, Willard W., 4,531,304, Cl. 34-30.000.

Best Lock Corporation: *See*—
Best, Walter E.; and Foshee, William R., 4,531,390, Cl. 70-372.000.
Foshee, William R., 4,531,389, Cl. 70-372.000.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Lock capping. 4,531,390, Cl. 70-372.000.

Bettesworth, Lyle J. Knife holder and carrying case. 4,531,696, Cl. 248-37.300.

Bettigole, Neal H. Prefabricated pavement module. 4,531,857, Cl. 404-44.000.

Bettigole, Neal H. Prefabricated pavement module. 4,531,859, Cl. 404-73.000.

Betts, William: *See*—
Bremer, Gordon; Betts, William; and Martinez, Kenneth, 4,532,640, Cl. 375-120.000.

Bienert, Horst; and Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Motor vehicle roof arrangement of the type interchangeably driveable by both motor and crank drives. 4,531,777, Cl. 296-223.000.

Bieringer, Hermann: *See*—
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.

Bijou, Joseph V.: *See*—
Baecker, Donald R.; and Bijou, Joseph V., 4,532,617, Cl. 367-19.000.

Bill, Rudolf; and Wolf, Rainer, to Sandoz Ltd. Flameproofing composition for polypropylene comprising a halogenated alkylaryl ether, an organo-tin compound and a sterically hindered phenol or bisphenol. 4,532,287, Cl. 524-343.000.

Biosound, Inc.: *See*—
Ballinger, Dale O., 4,532,615, Cl. 367-87.000.

Birocchi, Guido. Electric steam generator producing dry superheated steam for domestic use. 4,532,412, Cl. 219-271.000.

Bishop, Robert R.: *See*—
Neilson, James R.; and Bishop, Robert R., 4,531,308, Cl. 34-168.000.

Bismarck, Otto H., to RCA Corporation. Fast switching circuit. 4,532,436, Cl. 307-279.000.

Bittner, Norman, to Enviro-Spray Systems Incorporated. Can stuffer and method. 4,531,341, Cl. 53-117.000.

Black Clawson Company, The: *See*—
Creagan, Richard W.; and Patell, Thomas W., 4,532,008, Cl. 162-203.000.

Black, Ian A. Noise reduction in electronic measuring circuits. 4,532,442, Cl. 307-520.000.

Black, Laura E.; Miasek, Peter G.; and Adriaens, Georges, to Exxon Research and Engineering Co. Aromatic solvent upgrading using membranes. 4,532,029, Cl. 208-308.000.

Blackburn, Arthur M., to Otter Controls Limited. Electric motor protection switches. 4,532,488, Cl. 337-111.000.

Blauschild, Robert A., to Signetics Corporation. Differential amplifier circuit with rail-to-rail capability. 4,532,479, Cl. 330-261.000.

Bloch, Ricardo: *See*—
Ryer, Jack; Bloch, Ricardo; and Deen, Harold E., 4,532,062, Cl. 252-78.100.

Blodgett, Gerry A.: *See*—
Mattress, Albert, Jr., 4,531,770, Cl. 292-307.00R.

Blodgett, Norman S.: *See*—
Mattress, Albert, Jr., 4,531,770, Cl. 292-307.00R.

Blue Water, Ltd.: *See*—
Ward, James E., 4,531,584, Cl. 166-265.000.

Blum, Edward J.: *See*—
Jones, Charles; Gigon, Richard M.; and Blum, Edward J., 4,531,900, Cl. 418-61.00A.

Board of Regents, University of Washington: *See*—
Allan, G. Graham, 4,532,267, Cl. 523-106.000.

Boczkiewicz, Bruce M., to Heil Company, The. Lift mechanism for a dump truck. 4,531,780, Cl. 298-17.600.

Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Methyl substituted-2-oxohexane derivatives and processes for preparing and using same. 4,532,361, Cl. 568-382.000.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,532,364, Cl. 568-444.000.

Bodig, Bernd; Kull, Hermann; and Schleupen, Richard, to Robert Bosch GmbH. Speed-dependent signal generator. 4,532,437, Cl. 307-358.000.

Boehm, H. Russell: *See*—
Vito, Raymond P.; and Boehm, H. Russell, 4,531,286, Cl. 30-2.000.

Boeing Company, The: *See—*
Glancy, Jerry L., 4,531,769, Cl. 292-113.000.
Pinson, George T., 4,531,699, Cl. 248-550.000.

Boeke, Paul J.: *See—*
Boultinghouse, Harold D.; Boeke, Paul J.; Benefield, Robert E., Jr.; and Leland, John, 4,532,015, Cl. 204-38.400.

Boettcher, Ralph A., to Unitek Corporation. Method and article for facilitating the manufacture of a bondable metallic surface. 4,531,566, Cl. 164-246.000.

Bogner, Ben R.; and Grant-Acquah, Frank C. Method of shaping articles using shaping surfaces having release agent coating. 4,532,096, Cl. 264-109.000.

Bogo, Rene : *See—*
Barthez, Roland; Boissonnet, Francisque; and Bogo, Rene , 4,531,510, Cl. 126-419.000.

Bogue, John C.: *See—*
Wilcocks, Martin E. G., 4,532,647, Cl. 381-22.000.

Bohler, Hans; and Weisskopf, Ernst, to Sandoz Ltd. Sealing of anodically oxidized aluminum or aluminum alloy surfaces and compounds useful therefor. 4,531,979, Cl. 148-6.270.

Bohn, Helmut: *See—*
Raabe, Thomas; Bohn, Helmut; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,532,239, Cl. 514-247.000.

Boie, Immo; and Kovacic, Guido, to Agfa-Gevaert Aktiengesellschaft. Process and an apparatus for the development of photographic two-sheet diffusion materials. 4,532,201, Cl. 430-202.000.

Boiko, Alexandr V.: *See—*
Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., 4,531,934, Cl. 604-22.000.

Boillot, Jean-Paul; Begin, Ghislain; Alexandrov, N.; Fihey, Jean-Luc; Di Vincenzo, A.; and Villemure, Denis, to Canadian Patents and Development Limited. Real time control system and process for controlling predetermined operating characteristics of a welding mechanism. 4,532,404, Cl. 219-124.340.

Boissonnet, Francisque: *See—*
Barthez, Roland; Boissonnet, Francisque; and Bogo, Rene , 4,531,510, Cl. 126-419.000.

Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. Substituted triaryl phosphonium derivatives. 4,532,355, Cl. 568-9.000.

Bolton, Carl W.: *See—*
Scantlebury, Todd V.; Ambruster, Jeanne B.; Bolton, Carl W.; Campbell, Stephen E.; and Green, La Thaggar, III, 4,531,916, Cl. 433-173.000.

Bonnome, Jean-Pierre, to Union de Brasseries. Method of manufacturing and processing alcoholic beverages, and alcoholic liquids obtained by performing the method. 4,532,140, Cl. 426-13.000.

Borchert, Axel: *See—*
Larsson, Per-Olof; Mosbach, Klaus; and Borchert, Axel, 4,532,232, Cl. 502-403.000.

Borg-Warner Corporation: *See—*
Fogelberg, Mark J., 4,531,423, Cl. 74-475.000.

Bornstein, Michael, to Metromail Corporation. Bow spring detector for gripper mechanism. 4,531,726, Cl. 271-263.000.

Boronyak, Imre; and Gyokhegyi, Laszlo , to Kozponti Valto es Hitelbank RT. Plate for columns performing distillation and/or absorption processes. 4,532,087, Cl. 261-114.0JP.

Boros, Laszlo : *See—*
Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, 4,532,214, Cl. 435-228.000.

Boshagen, Horst: *See—*
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.

Boskamp, Jelles V., to Lever Brothers Company. Aqueous enzyme-containing compositions with improved stability. 4,532,064, Cl. 252-105.000.

Bossert, Friedrich: *See—*
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.

Botz, Jakob; Mutschler, Erich; Prohaska, Hans; Schmid, Eckhardt; and Scholl, Wolfgang, to ITT Industries, Inc. Servo mechanism, especially for intensifying the braking power in a motor vehicle. 4,531,419, Cl. 74-388.0PS.

Bouboulis, Constantine J., to Exxon Research & Engineering Co. Superior high solids coatings. 4,532,294, Cl. 524-773.000.

Bouery, Roger: *See—*
Moryl, Richard; and Bouery, Roger, 4,531,870, Cl. 411-108.000.

Bouillez, Olivier; and Imbert, Michel, to Gerin, Merlin. Rotating arc electric circuit breaker. 4,532,392, Cl. 200-147.00R.

Boulay, Jean-Louis; Larigaldie, Serge; and Reibaud, Jean-Louis, to Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Avions Marcel Dassault - Breguet Aviation (AMD-BA). Method and means for protecting an aircraft against disturbances of electrostatic origin. 4,531,691, Cl. 244-1.00A.

Boultinghouse, Harold D.; Boeke, Paul J.; Benefield, Robert E., Jr.; and Leland, John, to Phillips Petroleum Company. Poly(arylene sulfide) printed circuit boards. 4,532,015, Cl. 204-38.400.

Boury, Gerard R.: *See—*
Barlier, Pernette R. M.; Boury, Gerard R.; and Mazeau, Jean-Pierre, 4,532,221, Cl. 501-22.000.

Bout, Willem J. F., to U.S. Philips Corporation. Signalling light. 4,532,580, Cl. 362-306.000.

Boykin, Royce B., to Hackney Brothers Body Company, Inc. Method of forming an insulated body for a vehicle. 4,531,278, Cl. 29-469.000.

Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, to Wacker-Chemie GmbH. Polymerization process for aqueous polymer dispersions of vinyl esters and ethylenic monomers. 4,532,295, Cl. 524-827.000.

Brackelmanns, Norbert W.: *See—*
Ford, Raymond T.; Brackelmanns, Norbert W.; Wheatley, Carl F., Jr.; and Neilson, John M. S., 4,532,534, Cl. 357-23.400.

Bradley, Russell, to Sporting Aid, Inc. Portable sporting implement holder. 4,531,643, Cl. 211-64.000.

Bradley, William P., to Bedford Engineering Co. High speed method of making envelopes each with a double folded removable enclosure. 4,531,993, Cl. 156-227.000.

Bradshaw, Cyril E., to Eaton Corporation. Exhaust gas recirculation control and subassemblies therefor. 4,531,498, Cl. 123-568.000.

Brain, Charles; and Johnston, Barry, to J. M. Smucker Company, The. Spreadable honey. 4,532,143, Cl. 426-577.000.

Braithwaite, Jack: *See—*
Thornley, Derek; and Braithwaite, Jack, 4,532,570, Cl. 361-93.000.

Brandes, Wilhelm: *See—*
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,532,341, Cl. 549-559.000.

Brandstadter, Manfred: *See—*
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Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., to Data General Corporation. Digital data processing system with tripartite description-based addressing multi-level microcode control, and multi-level stacks. 4,532,586, Cl. 364-200.000.

Brausfeld, Walter: *See—*
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Bremer, Gordon; Betts, William; and Martinez, Kenneth, to Paradyne Corporation. Phase tracking loop for digital modem. 4,532,640, Cl. 375-120.000.

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Brick, Francis M., to F. M. Brick Industries, Inc. High-power rescue tool. 4,531,289, Cl. 30-134.000.

Bridge, Edward W., Jr. Meat tenderizer apparatus. 4,531,259, Cl. 17-26.000.

Briggs, Peter J.; and McAloon, Kevin, to Imperial Chemical Industries Limited. Fibrous material comprised of vermiculite coated fibers. 4,532,176, Cl. 428-288.000.

Brill, Gerow D., to Ampex Corporation. Continuous depth of focus control. 4,532,553, Cl. 358-228.000.

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Brokenshire, Robert E.: *See—*
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Brother Kogyo Kabushiki Kaisha: *See—*
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Brouwer, Cornelis A., to IHC Holland N.V. Vessel comprising two pivotably connected hull sections. 4,531,469, Cl. 114-29.000.

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Brown, Barbara A.: *See—*
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Brown, Boveri & CIE AG: *See—*
Weddigen, Gert, 4,532,195, Cl. 429-213.000.

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Browne, Alan L., to General Motors Corporation. Vehicle windshield lubrication system. 4,531,607, Cl. 180-282.000.

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Buchelt, Benno. Water turbine. 4,531,888, Cl. 415-148.000.
Bullock, Wilbur W., to Kinney, William M.; and Bernardi, A. L. Rug puller. 4,531,771, Cl. 294-104.000.
Bunch, Paul D.; and Stevens, Russell E., to Cameron Iron Works, Inc. Valve and stem seal therefor. 4,531,711, Cl. 251-214.000.
Burack, Robert D.; and Saska, Thomas J., to Westinghouse Electric Corp. Flexible induction brazing wand for hollow tubes. 4,532,396, Cl. 219-10.49R.
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Holz, George E.; and Ogle, James A., 4,532,505, Cl. 340-775.000.
Phelps, Andrew E., 4,532,606, Cl. 365-49.000.
Burroughs Wellcome Co.: *See—*
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Burson, Bob O., to R. E. Phelon Company, Inc. Fail safe ignition cut-off system. 4,531,500, Cl. 123-630.000.
Burt, James G., to Cellu Products Company. Method and apparatus for recovering blowing agent from scrap foam. 4,531,950, Cl. 55-23.000.
Burt, James G.; and Franklin, Boyd M., to Cellu Products Company. Method and apparatus for recovering blowing agent in foam production. 4,531,951, Cl. 55-23.000.
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Buschmann, Ernst; Schulz, Guenter; Heilen, Gerd; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Neopentyl-phenethyltriazoles, their preparation and fungicides containing these compounds. 4,532,234, Cl. 514-63.000.
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Collins, H. Dale; Busse, Lawrence J.; and Lemon, Douglas K., 4,531,411, Cl. 73-603.000.
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Butterfield, Ida M., to Butterfield Group. Tamper-resistant hypodermic syringe. 4,531,940, Cl. 604-111.000.
Bylund, Sven O., to Santrade Ltd. Cutting insert. 4,531,864, Cl. 407-114.000.
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Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, 4,532,298, Cl. 525-96.000.
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Cadee, Theodorus P. M., to Van Doorne's Transmissie B.V. Transmission, in particular for a motor vehicle. 4,531,927, Cl. 474-72.000.
Cairns, Thomas M.; Dewar, John H.; and Sumner, Emmons F., to Ford Motor Company. Blade coupling terminal. 4,531,808, Cl. 339-258.00S.
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Caldwell, David; Miller, David; and Padget, John C., to Imperial Chemical Industries PLC. Flash-rust protecting of ferrous substrate. 4,532,159, Cl. 427-388.400.
Cale, Roland E., Jr. Method of manufacturing clevis end connecting rod. 4,531,665, Cl. 228-170.000.
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Groose, James E.; and Liu, Paul K. T., 4,531,953, Cl. 55-74.000.
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Camco, Incorporated: *See—*
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Campbell, Stephen E.: *See—*
Scantlebury, Todd V.; Ambruster, Jeanne B.; Bolton, Carl W.; Campbell, Stephen E.; and Green, La Thaggar, III, 4,531,916, Cl. 433-173.000.
Canadian Patents and Development Limited: *See—*
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Fushimoto, Hideo, 4,532,529, Cl. 346-136.000.
Hatanaka, Katsunori; and Uzawa, Shunichi, 4,532,536, Cl. 357-30.000.
Hoshino, Osamu, 4,531,828, Cl. 355-3.0SH.
Kitajima, Tadayuki; and Kimura, Akiyoshi, 4,531,831, Cl. 355-57.000.
Saitoh, Keishi; and Arao, Kozo, 4,532,198, Cl. 430-84.000.
Sawamura, Mitsuharu, 4,531,838, Cl. 356-382.000.
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Cantrell, Ben H.; Gordon, William B.; and Trunk, Gerard V. Angle of arrival measurements for two unresolved sources. 4,532,515, Cl. 343-16.00R.
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Ballmer, Horst, 4,531,814, Cl. 350-355.000.
Baumgartel, Patrice, 4,531,816, Cl. 350-521.000.
Carley, Earl P., to PPG Industries, Inc. High performance fiber ribbon product, high strength hybrid composites and methods of producing and using same. 4,532,169, Cl. 428-109.000.
Carlos, Donald D., to Warner-Lambert Company. Hydrocarbon oxidate composition. 4,532,060, Cl. 252-55.000.
Carlsen, W. John, to GTE Laboratories Incorporated. Optical fiber holders. 4,531,810, Cl. 350-96.200.
Carrier Corporation: *See—*
Clark, William E.; and Wellman, Donald C., 4,531,573, Cl. 165-16.000.
Zinsmeyer, Thomas M., 4,531,375, Cl. 62-85.000.
Carroll, Curtis E. Rail car dumping system and method. 4,531,877, Cl. 414-372.000.
Carter, Gary M.; Chen, Yung-Jui; and Tripathy, Sukant K., to GTE Laboratories Incorporated. Optical waveguide coupling device. 4,531,809, Cl. 350-96.190.
Casals-Stenzel, Jorge: *See—*
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Casebolt, Barion: *See—*
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Casebolt, James E., Jr.: *See—*
Haynes, Nolan F., 4,531,481, Cl. 123-44.00R.
Cash Engineering Co. Pty. Ltd.: *See—*
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Raabe, Thomas; Bohn, Helmut; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,532,239, Cl. 514-247.000.
Castle, John E.; and Deschamps, Jeffrey R., to University of Delaware. Microcrystalline chitin and method of manufacture. 4,532,321, Cl. 536-20.000.
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Amdall, John K.; and Ballheimer, Benny, 4,531,746, Cl. 277-53.000.
Bailey, John M.; Gibson, Dennis H.; Hackett, David E.; Stockner, Alan R.; and Waldman, Donald J., 4,531,494, Cl. 123-450.000.
Gibson, Dennis H., 4,531,492, Cl. 123-364.000.
Hart, Cullen P.; and Klopfenstein, Wayne A., 4,531,787, Cl. 305-12.000.
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Cavex-France, Sarl: *See—*
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Cawley, William E., to United States of America, Energy. Producing tritium in a homogenous reactor. 4,532,102, Cl. 376-185.000.
Celanese Corporation: *See—*
Hagedorn, Scott, 4,532,209, Cl. 435-156.000.
Cellu Products Company: *See—*
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Burt, James G.; and Franklin, Boyd M., 4,531,951, Cl. 55-23.000.
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Chadwick-Helmuth Company, Inc.: *See—*
Chadwick, James R.; and Johnson, Lloyd N., 4,531,408, Cl. 73-455.000.
Chadwick, James R.; and Johnson, Lloyd N., to Chadwick-Helmuth Company, Inc. Control of rotor blade stroboscopic display. 4,531,408, Cl. 73-455.000.
Chafetz, Harry, to Texaco Inc. Spirolactone condensation product dispersants and lubricants containing same. 4,532,058, Cl. 252-51.50A.
Chambaz, Bernard; Delapierre, Gilles; and Destannes, Louis, to Commissariat a l'Energie Atomique. Capacitive hygrometer and its production process. 4,532,016, Cl. 204-38.300.
Chambers, Carl E.; and Brogioli, Paul A. Portable disposable grilling. 4,531,506, Cl. 126-9.00A.
Chandler Evans, Inc.: *See—*
Zagranski, Raymond D.; and Howlett, James J., 4,531,361, Cl. 60-39.161.
Chandler, Richard A.: *See—*
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Chang, Kwangling; and Mistry, Dalpat D., to NEI Canada Limited. Display or indicating element with bent core. 4,531,318, Cl. 40-449.000.

Chang, Kwei K. Loose leaf binder spacer. 4,531,764, Cl. 281-29.000.
Chao, Tze; and Nyquist, Jack K., to Du Pont de Nemours, E. I., and Company. Iron chloride waste treatment in molten salt. 4,532,113, Cl. 423-138.000.
Charneski, Mitchell D.: *See—*
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Chenera, Robert. Body stretching and exercising device. 4,531,730, Cl. 272-144.000.
Cheung, Derek T., to Rockwell International Corporation. Pyroelectric thermal detector array. 4,532,424, Cl. 250-338.000.
Chevron Research Company: *See—*
Fries, Bernard A., 4,532,026, Cl. 208-164.000.
Nielsen, William C., 4,532,025, Cl. 205-113.000.
Schinski, William L.; and Lukens, Raymond J., 4,531,968, Cl. 71-98.000.
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Christensen, Don C.; and Voss, Raymond G. Contacting arylene sulfide polymer with oxygen in extruder by continuous processing. 4,532,310, Cl. 525-537.000.
Christian, Eric E.; and Spector, George. Cycle repair stand. 4,531,712, Cl. 254-88.000.
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Christie, Nick J.; Cox, Randall A.; James, Robert E.; and Stevenson, James C., to Diamond Shamrock Chemicals Company. Aftertreatment of dyed cellulosic materials. 4,531,946, Cl. 8-192.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Zeolite catalysts modified with Group VI A metal. 4,532,226, Cl. 502-71.000.
Chu, Simon C. K.: *See—*
Springer, Charles S., Jr., Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., 4,532,217, Cl. 436-79.000.
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Muller, Beat, 4,532,332, Cl. 548-473.000.
Rosenberger, Siegfried, 4,532,059, Cl. 252-52.00R.
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Cibie , Pierre. Rotary electric machine forming more especially a speed variator or a torque converter. 4,532,447, Cl. 310-114.000.
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Clark, William E.; and Wellman, Donald C., to Carrier Corporation. Variable volume multizone unit. 4,531,573, Cl. 165-16.000.
Claunch, Carney P., II; Kridl, Thomas A.; and Gamarra, Jose P., to Raychem Corporation. Heat-shrinkable article. 4,532,164, Cl. 428-36.000.
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Voges, Wolfgang, 4,531,874, Cl. 412-37.000.
Clauss, Gerhard, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Process for the preparation of a paper container equipped with a reinforcing ring, and a reinforcing ring for such process. 4,531,930, Cl. 493-108.000.
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Cogan, Howard F.: *See—*
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Cohen, Frederick. Valve assembly method. 4,531,272, Cl. 29-157.10R.
Cohen, Leon E.; and Hook, John A., to FMC Corporation. Method and composition for cleaning anodized aluminum. 4,532,065, Cl. 252-135.000.
Cohr, Lindsay W. J.: *See—*
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Cole, Leon M., to Great Lakes Chemical Corporation. Process for producing densified halogenated dimethylhydantoins. 4,532,330, Cl. 548-311.000.
Coles, Otis C., III. Fluid bypass control for producing well plunger assembly. 4,531,891, Cl. 417-59.000.
Collin, Thorbjorn; Erikmats, Borje; Forsberg, Svante; Goransson, Harry; Sander, Lars; and Solver, Carl E., to ASEA Aktiebolag. Means for detecting the contact wear of electrical switching devices. 4,532,499, Cl. 340-644.000.
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Collins, H. Dale; Busse, Lawrence J.; and Lemon, Douglas K., to United States of America, Energy. Acoustic emission linear pulse holography. 4,531,411, Cl. 73-603.000.
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Colvin, Howard A., to Goodyear Tire & Rubber Company, The. Inhibiting polymerization of vinylaromatic monomers. 4,532,011, Cl. 203-9.000.
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Compagnie Francaise de Raffinage: *See—*
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Compagnie Francaise d'Etudes et de Construction "Technip" : *See—*
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Comptech, Incorporated: *See—*
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Comtech Research Unit Limited: *See—*
Humberstone, Victor C.; and Fisher, John H., 4,532,197, Cl. 430-41.000.
Condy, Robert J. Variable capacity reusable dual tape dispensing cartridge. 4,531,690, Cl. 242-197.000.
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Warman, Bruce L.; Dailey, Carl W.; and Johnson, Floyd D., 4,531,453, Cl. 98-2.110.
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Drabek, Jozef, to Ciba-Geigy Corporation. Pesticidal N-methyl-carbamic acid esters. 4,532,256, Cl. 514-469.000.

Drake, Charles A., to Phillips Petroleum Company. Method for producing ketones and phenols. 4,532,360, Cl. 568-357.000.

Drake, James R.: *See—*
Frampton, Victor A.; Drake, James R.; and Slump, William R., 4,532,516, Cl. 343-17.700.

Draper Corporation: *See—*
Showers, Steven J., 4,531,556, Cl. 139-448.000.

Drechsel, Arno. Impact irrigator with controlled return. 4,531,674, Cl. 239-230.000.

Dreher, Gunther; and Lexen, Gerald, to M.A.N.-Maschinenfabrik Augsburg Nurnberg. Method and device for controlling a motor vehicle power unit. 4,531,431, Cl. 74-866.000.

Dresser Industries, Inc.: *See—*
Maddalozzo, Raymond J., 4,531,709, Cl. 251-48.000.

Dries, Hubertus W. A. A., to Shell Oil Company. Method and apparatus for continuously cleaning a heat exchanger during operation. 4,531,570, Cl. 165-1.000.

Du Pont-Mitsui Polychemicals Co., Ltd.: *See—*
Tada, Seiichi, 4,532,307, Cl. 525-451.000.

Dubilier PLC: *See—*
Phillips, John P., 4,532,489, Cl. 337-228.000.

Dubin, Leonard, to Nalco Chemical Company. Silica inhibition: prevention of silica deposition by addition of low molecular weight organic compounds. 4,532,047, Cl. 210-698.000.

Dubots, Patrick, to Alsthom-Atlantique, S.A. Superconductor manufacturing process. 4,531,982, Cl. 148-11.50F.

Ducellier et Cie: *See—*
Croissant, Jonny, 4,531,501, Cl. 123-634.000.

Ducote, Marjorie E.; and Greer, Charles L., Jr., to United States of America, Army. Amine bonding agents in polyester binders. 4,531,989, Cl. 149-19.200.

Dudli, Andreas: *See—*
Fuchs, Ernst; and Dudli, Andreas, 4,532,035, Cl. 210-150.000.

Dunn, David C.; and Scarrow, David. Vascular clamp. 4,531,519, Cl. 128-327.000.

Dunn, Edward G., Jr.; and Dunn, Edward G., Sr. Bumper for outdoor bumper pool table. 4,531,739, Cl. 273-127.00C.

Dunn, Edward G., Sr.: *See—*
Dunn, Edward G., Jr.; and Dunn, Edward G., Sr., 4,531,739, Cl. 273-127.00C.

Dunrite, Inc.: *See—*
Anderson, William H., 4,531,256, Cl. 15-300.00A.

Dupin, Thierry, to Rhone-Poulenc Specialites Chimiques. Catalytic desulfurization of industrial waste gases. 4,532,119, Cl. 423-230.000.

Du Pont de Nemours, E. I., and Company: *See—*
Chao, Tze; and Nyquist, Jack K., 4,532,113, Cl. 423-138.000.
Hoffman, Gary R., 4,532,501, Cl. 340-679.000.
Taylor, Barry E., 4,532,075, Cl. 252-514.000.

Durand, Daniel; and Grandadam, Yves, to Fromageries Bel. Milky products for manufacturing chocolate-trade products and method or preparation thereof. 4,532,146, Cl. 426-580.000.

Durslen, Heinz; Faust, Winifried; and Schlosser, Rainer, to Krupp-Koppers GmbH. Door structure for coking ovens. 4,532,010, Cl. 202-248.000.

Dusman, Richard J.; and Nine, Harmon D., to General Motors Corporation. Modular drawbead structure. 4,531,395, Cl. 72-350.000.

DuVall, Dale R., to Mead Corporation, The. Device for electrical variable magnification of document image. 4,532,602, Cl. 364-577.000.

Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Concrete shielding housing for receiving and storing a nuclear fuel element container. 4,532,428, Cl. 250-507.100.

Dynabrade, Inc.: *See—*
Huber, Paul W., 4,531,329, Cl. 51-273.000.

Dynapol: *See—*
Sheldon, Bernard G.; Wingard, Robert E., Jr.; Weinshenker, Ned M.; and Dawson, Daniel J., 4,532,128, Cl. 424-78.000.

Dysan Corporation: *See—*
Larson, Bert R.; Wartenbergh, Robert P.; Warszawski, Janusz; Meier, Markus; Sutton, David A.; Ho, Bin-Lun; and Bronshvatch, Efim, 4,532,564, Cl. 360-97.000.

Dzewaltowski, Victor F.; and Millay, Lawrence I., to Ex-Cell-O Corporation. Centerless grinding machine with ferris wheel arrangement. 4,531,327, Cl. 51-103.0WH.

Earley, John J. Removable garbage bag holder for kitchen sinks. 4,531,246, Cl. 4-629.000.

Eary, George D., Sr. Adjustable upper body rest. 4,531,247, Cl. 5-436.000.

Eastman Kodak Company: *See—*
Kroll, Arthur S.; and Shuster, Frank A., 4,531,832, Cl. 355-3.0DD.
Mahar, Ralph W., 4,532,177, Cl. 428-328.000.

Eaton Corporation: *See—*
Bradshaw, Cyril E., 4,531,498, Cl. 123-568.000.
Gale, Allan R.; and Chute, Richard, 4,532,460, Cl. 318-139.000.
Hazel, Michael E., 4,531,621, Cl. 192-58.00B.
Holmes, Russell C., 4,531,430, Cl. 74-858.000.
Hoppie, Lyle O.; and Chute, Richard, 4,531,719, Cl. 267-57.10R.
Hoppie, Lyle O., 4,532,163, Cl. 428-36.000.
Reiner, Richard A.; Siebenlist, John J.; and Clarey, Robert J., 4,532,574, Cl. 361-365.000.
Smith, Stanley K., 4,532,599, Cl. 364-552.000.

Eaton, Homer L., to Vektronics, Inc. Composite tape preparation and application. 4,531,992, Cl. 156-152.000.

Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., to R. P. Scherer Corporation. Masticatory soft elastic gelatin capsules and method for the manufacture thereof. 4,532,126, Cl. 424-48.000.

Eck, Herbert: *See—*
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,532,295, Cl. 524-827.000.

Eckels, Robert E. Collapsible steering column. 4,531,619, Cl. 188-371.000.

Eckert, Konrad; Ripper, Wolfgang; and Wessel, Wolf, to Robert Bosch GmbH. Control device for regulating the exhaust gas recycling rate in an internal combustion engine with self-ignition. 4,531,499, Cl. 123-571.000.

Eckhardt, Heinz; Halbritter, Klaus; Goetz, Norbert; and Heilen, Gerd, to BASF Aktiengesellschaft. Preparation of 3-formyl-5,6-dihydro-2H-pyran. 4,532,337, Cl. 549-425.000.

Edakubo, Hiroo, to Canon Kabushiki Kaisha. Cassette tape tensioning device. 4,532,563, Cl. 360-96.500.

Edelstein, William A., to General Electric Company. Nuclear magnetic resonance imaging using pulse sequences combining selective excitation and driven free precession. 4,532,474, Cl. 324-309.000.

Edson, James B.; and Monroe, Patrick G., to American District Telegraph Company. Security system with multiple levels of access. 4,532,507, Cl. 340-825.310.

Edson, Sydney: *See—*
Howard, Fred; Edson, Sydney; Merl, Milton J.; and Di Marchi, Silvio J., 4,531,311, Cl. 40-10.00R.

Edwards, K. David G. Renoprotective treatments employing vasodilator compounds. 4,532,135, Cl. 514-222.000.

Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, to Agency of Industrial Science & Technology; Hanano Commerical Co., Ltd.; Taihei Chemical Industrial Co., Ltd.; and Kabushiki Kaisha Gosei Kagaku Kenkyusho. Releasing lubricant for use in forging and extrusion processes. 4,532,055, Cl. 252-28.000.

Ehrhart, Philip J.; Makofka, Stanley J.; and McLean, Kenneth W., to Sperry Corporation. Rotary cutter for disc mower-conditioner. 4,531,349, Cl. 56-13.600.

Eichelberger, Leo; and Ciszewski, Hans-Joachim, to Siemens Aktiengesellschaft. Double-walled, flexible hose. 4,531,551, Cl. 138-129.000.

Eichhorn, Rudolf: *See—*
Schroder, Gunter; Eichhorn, Rudolf; and Schrader, Heinolf, 4,531,682, Cl. 242-54.00R.

Ektelon: *See—*
Mortvedt, Raymond L.; and Thompson, Steven M., 4,531,738, Cl. 273-73.00C.

Elarde, Vito D. Fabrication of a printed circuit board with metal-filled channels. 4,532,152, Cl. 427-96.000.

Eldex Laboratories, Inc.: *See—*
Clark, Keith S., 4,531,840, Cl. 366-142.000.

Electronic Solutions: *See—*
Shah, Satish C., 4,531,640, Cl. 211-41.000.

Ellingson, David I.: *See—*
Cotton, Curran D.; Ellingson, David I.; Noe, William J.; and Wilson, James D., 4,531,387, Cl. 68-3.00R.
Elliott, Guy R. B.; McDaniel, Milton W.; and Houseman, Barton L. Substantially self-powered fluid turbines. 4,531,593, Cl. 175-71.000.
Elscint Inc.: *See—*
Abileah, Adi; Gafni, Giora; and Simerman, Miguel O., 4,532,425, Cl. 250-363.00S.
Endo, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Ueno, Susumu, to Shin-Etsu Chemical Co., Ltd. Method for providing a coating layer of silicon carbide on the surface of a substrate. 4,532,150, Cl. 427-39.000.
Energy Conversion Devices, Inc.: *See—*
Nath, Prem; and Izu, Masatsugu, 4,532,372, Cl. 136-256.000.
Yu, Terry T.; and Yen, Mei-Rong, 4,532,078, Cl. 260-396.00R.
Energy Research Corporation: *See—*
Baker, Bernard S.; and Ghezel-Ayagh, Hossein G., 4,532,192, Cl. 429-19.000.
Eneroil Research Ltd.: *See—*
Smith, Robert W., 4,531,497, Cl. 123-525.000.
Engel, Larry J.; and Turko, John W., to Michigan Consolidated Gas Co. Gaseous fuel refueling apparatus. 4,531,558, Cl. 141-44.000.
Engelhardt, David R., to R. Englehardt Nominees Pty. Ltd. Color process for spectacle frame coated with polyester. 4,531,947, Cl. 8-495.000.
Engels, Walter, to Milliken Research Corporation. Cutting rotor blade segment. 4,531,265, Cl. 26-9.000.
England, William T.; and Lau, Wing Y. T., to Kendall Company, The. Fabric cover for dampener rolls. 4,531,386, Cl. 66-202.000.
Engleman, Christian F. Radial braking system. 4,531,754, Cl. 280-261.000.
Engman, Guy R., to AB Thorns Mekaniska Verkstad. Adaptive method and apparatus for correcting deviations in the shape of objects. 4,531,391, Cl. 72-10.000.
Enomoto, Hiroshi; Kawamata, Masanobu; Nomura, Akira; Aoyagi, Yoshiaki; and Ueda, Fusao, to Nippon Shinyaku Co., Ltd. Finely pulverized 2,4-diamino-6-(2,5-dichloro-phenyl)-1,3,5-triazine and pharmaceutically acceptable acid addition salts thereof. 4,532,238, Cl. 514-245.000.
Enviro-Spray Systems Incorporated: *See—*
Bittner, Norman, 4,531,341, Cl. 53-117.000.
Equi, John E. Compact expansion chamber for small engines. 4,531,364, Cl. 60-314.000.
Erdman, David M.; and Harms, Harold B., to General Electric Company. Laundering apparatus, method of operating a laundry machine, control system for an electronically commutated motor and method of operating an electronically commutated motor. 4,532,459, Cl. 318-138.000.
Erhardt & Leimer GmbH: *See—*
Mohr, Peter R., 4,532,167, Cl. 428-78.000.
Erickson, Chad S., to Alternative Pioneering Systems, Inc. Food dehydrator with moisture sensing control. 4,531,306, Cl. 34-44.000.
Erikmats, Borje: *See—*
Collin, Thorbjorn; Erikmats, Borje; Forsberg, Svante; Goransson, Harry; Sander, Lars; and Solver, Carl E., 4,532,499, Cl. 340-644.000.
Erwin Sick GmbH Optik-Elektronik: *See—*
Ross, Dieter; and Ostertag, Klaus, 4,532,430, Cl. 250-572.000.
Sackmann, Karl H.; and Anselment, Christoph, 4,532,388, Cl. 200-61.430.
Eshland Enterprises, Inc.: *See—*
Eshleman, Roger D., 4,531,464, Cl. 110-259.000.
Eshleman, Roger D., to Eshland Enterprises, Inc. Particle fuel diversion structure. 4,531,464, Cl. 110-259.000.
Eskina, David A. Puzzle. 4,531,741, Cl. 273-157.00R.
ESPE, Fabrik pharmazeutischer Praparate GmbH: *See—*
Jochum, Peter; Hubner, Heijo; and Gasser, Oswald, 4,532,268, Cl. 523-109.000.
Esper, Friedrich J.; Fischer, Hermann; Friese, Karl-Hermann; and Scharner, Peter, to Robert Bosch GmbH. Temperature-compensated, oxygen-content gas sensor. 4,532,492, Cl. 338-34.000.
Esposito, Anthony: *See—*
Acson, Paul; and Esposito, Anthony, 4,531,310, Cl. 40-1.500.
Essilor International (Compagnie Generale d'Optique): *See—*
Stoerr, Jacques, 4,531,297, Cl. 33-200.000.
Ethicon, Inc.: *See—*
Bedi, James J.; and Joshi, Madhusudan, 4,531,522, Cl. 128-335.000.
Ethyl Corporation: *See—*
Everly, Charles R.; and Roper, Jerry M., 4,532,356, Cl. 568-315.000.
Knapp, Gordon G., 4,531,948, Cl. 44-53.000.
Ranken, Paul F., 4,532,326, Cl. 546-156.000.
Smith, Isaac L.; and Nelson, Gunner E., 4,532,120, Cl. 423-347.000.
Swanson, Barry J.; and Shubkin, Ronald L., 4,532,368, Cl. 568-791.000.
Wolfram, Joachim W., 4,532,345, Cl. 562-406.000.
Etoh, Yukihiro: *See—*
Iiyama, Akihiro; Miyazaki, Hiroaki; Etoh, Yukihiro; and Tanaka, Toshiaki, 4,531,491, Cl. 123-357.000.
Eugen Lutz GmbH & Co. Maschinenfabrik: *See—*
Bergler, Otto, 4,531,441, Cl. 83-471.300.
Europaisches Laboratorium fur Molekularbiologie (EMBL): *See—*
Ansorge, Wilhelm, 4,532,205, Cl. 435-30.000.
Evans, Leighton D. Relating to latch security devices. 4,531,633, Cl. 206-230.000.
Everest-Todd, Selwyn, to Willow House Research Unit. Protection agent for fruits and vegetable tubers. 4,532,156, Cl. 427-220.000.
Everly, Charles R.; and Roper, Jerry M., to Ethyl Corporation. Chemical process. 4,532,356, Cl. 568-315.000.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrancs Inc. 1,2,3,3,5,6-Hexamethyl-bicyclo[2.2.2]oct-5-en-2-ol, process for producing same, intermediates useful in said process and organoleptic uses of same. 4,532,359, Cl. 568-346.000.
Ex-Cell-O Corporation: *See—*
Dzewaltowski, Victor F.; and Millay, Lawrence I., 4,531,327, Cl. 51-103.0WH.
Jackson, Theodore A., 4,531,444, Cl. 89-1.400.
Exxon Research and Engineering Co.: *See—*
Barnett, Allan E.; and Halluin, Albert P., 4,532,351, Cl. 564-415.000.
Becht, Charles, IV, 4,532,108, Cl. 422-143.000.
Black, Laura E.; Miasek, Peter G.; and Adriaens, Georges, 4,532,029, Cl. 208-308.000.
Bouboulis, Constantine J., 4,532,294, Cl. 524-773.000.
Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., 4,532,229, Cl. 502-330.000.
Frankenfeld, John W.; and Bruncati, Robert L., 4,532,027, Cl. 208-255.000.
Humphries, Michael J.; Liu, Chih-an; and Krutenat, Richard C., 4,532,191, Cl. 428-678.000.
Kern, Kenneth C., 4,531,862, Cl. 406-155.000.
Lin, An-Chung R., 4,531,976, Cl. 106-27.000.
McVicker, Gary B., 4,532,325, Cl. 546-2.000.
Ryer, Jack; Bloch, Ricardo; and Deen, Harold E., 4,532,062, Cl. 252-78.100.
Shuey, Harry F.; and Wan, Wankei, 4,532,041, Cl. 210-500.200.
Wagensommer, Joseph; Klein, Robert R.; and Lundberg, Robert D., 4,532,302, Cl. 525-343.000.
F.I.P., S.A. De C.V.: *See—*
Tort O., Alejandro, 4,531,710, Cl. 251-167.000.
F. M. Brick Industries, Inc.: *See—*
Brick, Francis M., 4,531,289, Cl. 30-134.000.
Fabiny, William J.: *See—*
Mosser, Mark F.; and Fabiny, William J., 4,532,289, Cl. 524-406.000.
FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien: *See—*
Spielmann, Norbert; and Bauer, Hermann, 4,531,452, Cl. 92-168.000.
Fahmy, Mohamed A. H., to FMC Corporation. O-Ethyl S-propyl S-s-butyl phosphorodithioate. 4,532,235, Cl. 514-144.000.
Farnum, Henry M. Frame for photographs, visual displays, and three-dimensional objects. 4,531,316, Cl. 40-159.000.
Fast, Jacob. Merchandise information tag with improved mounting arrangement. 4,531,313, Cl. 40-19.500.
Faulhaber, Gerhard: *See—*
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Rauben Heimer, Hans-Juergen, 4,532,320, Cl. 528-498.000.
Faust, Winifried: *See—*
Durslen, Heinz; Faust, Winifried; and Schlosser, Rainer, 4,532,010, Cl. 202-248.000.
Favre, Roger: *See—*
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,532,315, Cl. 528-14.000.
Fazio, Michael J., to Dow Chemical Company, The. Preparation of anionic and cationic polymers from 2-oxazolines. 4,532,303, Cl. 525-344.000.
Fazio, Michael J., to Dow Chemical Company, The. Modification of polymeric amine salts. 4,532,304, Cl. 525-385.000.
Federau, Gregor. Line-scan panoramic camera. 4,532,544, Cl. 358-87.000.
Federico, Anthony M.; Ippolito, Ronald A.; and Legg, Ernest L., to Xerox Corporation. Race control suspension. 4,532,584, Cl. 364-140.000.
Feinland, Raymond; Pohl, Stanley; and Hnatchenko, Michael, to Clairol Incorporated. Composition for lightening or coloring hair containing an oxidizing agent and certain quaternary amines. 4,532,127, Cl. 424-62.000.
Feinstone, Stephen M.: *See—*
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,532,215, Cl. 435-237.000.
Fellrath, Jean: *See—*
Gerber, Bernard; and Fellrath, Jean, 4,532,535, Cl. 357-23.500.
Fenton, Donald M., to Union Oil Company of California. Arsenic removal method. 4,532,044, Cl. 210-660.000.
Fenzl, Hans J.: *See—*
Dietze, Wolfgang; and Fenzl, Hans J., 4,532,090, Cl. 264-14.000.
Ferrofluidics Corporation: *See—*
Raj, Kuldip, 4,531,846, Cl. 384-478.000.
Ferry, William R.: *See—*
Parent, Christopher A.; and Ferry, William R., 4,531,314, Cl. 40-119.000.
Fertier, Marcel; and Cuny, Bernard G., to Games. Device enabling a load to be braked and/or held, notably an anti-fall safety device. 4,531,610, Cl. 182-5.000.
F'Geppert, Erwin, to United States of America, Army. Shaft-mounted equipments. 4,531,847, Cl. 384-519.000.
Fiatallis Europe, S.p.A.: *See—*
Barbagli, Rino O., 4,531,601, Cl. 180-6.480.

Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., to Exxon Research and Engineering Co. Process for preparing a Fe-Co catalyst slurry system for alpha olefin production. 4,532,229, Cl. 502-330.000.

Fields, Thomas L.: *See*—
Lang, Stanley A., Jr.; Fields, Thomas L.; Wilkinson, Raymond G.; Kang, Soon M.; and Lin, Yang-I, 4,532,349, Cl. 564-194.000.

Fihey, Jean-Luc: *See*—
Boillot, Jean-Paul; Begin, Ghislain; Alexandrov, N.; Fihey, Jean-Luc; Di Vincenzo, A.; and Villemure, Denis, 4,532,404, Cl. 219-124.340.

Fine Organics Limited: *See*—
Jackson, Arthur; and Heyes, Graham, 4,532,322, Cl. 544-54.000.

Fineberg, Douglas H., to Baker Oil Tools, Inc. Downhole flapper valve. 4,531,587, Cl. 166-332.000.

Finn, Bernard J.: *See*—
Rezanka, Richard L.; and Finn, Bernard J., 4,531,759, Cl. 280-668.000.

Firestone Tire & Rubber Company, The: *See*—
Tomaszewski, Walter; and Yang, James H. C., 4,531,339, Cl. 52-716.000.

Fischer, Hermann: *See*—
Esper, Friedrich J.; Fischer, Hermann; Friese, Karl-Hermann; and Scharner, Peter, 4,532,492, Cl. 338-34.000.

Fisher, John H.: *See*—
Humberstone, Victor C.; and Fisher, John H., 4,532,197, Cl. 430-41.000.

Fisher, Paul A., to Sperry Corporation. Slew length timer. 4,532,504, Cl. 340-739.000.

Fitness Products, Inc.: *See*—
Wrinkle, Rodney P., 4,531,729, Cl. 272-123.000.

Flintkote Company, The: *See*—
Winters, Donald C.; and Klein, Ivan D., 4,532,006, Cl. 162-3.000.

Flores, Christopher; Gopinath, Bhaskarpillai; and Limb, John O., to AT&T Bell Laboratories. Collision avoiding system and protocol for a two path multiple access digital communications system. 4,532,626, Cl. 370-85.000.

Flores, David P.: *See*—
Hoenig, Stephen M.; Flores, David P.; and Ginter, Sally P., 4,532,187, Cl. 428-457.000.

FMC Corporation: *See*—
Cohen, Leon E.; and Hook, John A., 4,532,065, Cl. 252-135.000.
Fahmy, Mohamed A. H., 4,532,235, Cl. 514-144.000.
Kemp, David M., Jr.; and Jones, Hartl R., 4,531,456, Cl. 99-323.200.

Focke & Co.: *See*—
Focke, Heinz; and Balmer, Oskar, 4,531,597, Cl. 177-84.000.

Focke, Heinz; and Balmer, Oskar, to Focke & Co. Apparatus for forming tobacco portions. 4,531,597, Cl. 177-84.000.

Fogelberg, Mark J., to Borg-Warner Corporation. Spring-assisted shift apparatus. 4,531,423, Cl. 74-475.000.

Fontenot, Delouis J., to Phillips Petroleum Company. Valve means and fluid transport system. 4,531,549, Cl. 137-864.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Ovenable carton with removable lid. 4,531,668, Cl. 229-43.000.

Ford, George W., Jr., to Wright, Hershel Earl. Foam dispensing device. 4,531,660, Cl. 222-209.000.

Ford, James M.: *See*—
Wright, David B.; Ralston, Richard W., Jr.; and Ford, James M., 4,532,018, Cl. 204-98.000.

Ford, John A.; and Whittaker, Raymond A., to Coal Industry (Patents) Ltd. Mining equipment. 4,531,782, Cl. 299-1.000.

Ford Motor Company: *See*—
Cairns, Thomas M.; Dewar, John H.; and Sumner, Emmons F., 4,531,808, Cl. 339-258.00S.
Daniels, Vernon A.; Park, Joonmin; and Ivanyi, Steven, 4,532,097, Cl. 264-258.000.

Ford, Raymond T.; Brackelmanns, Norbert W.; Wheatley, Carl F., Jr.; and Neilson, John M. S., to RCA Corporation. MOSFET with perimeter channel. 4,532,534, Cl. 357-23.400.

Forerank, Inc.: *See*—
Summers, David P., 4,531,768, Cl. 285-338.000.

Forintek Canada Corp.: *See*—
Walser, Donald C., 4,531,435, Cl. 82-40.00R.

Forrest, William J. Animal holding chute. 4,531,478, Cl. 119-98.000.

Forsberg, Svante: *See*—
Collin, Thorbjorn; Erikmats, Borje; Forsberg, Svante; Goransson, Harry; Sander, Lars; and Solver, Carl E., 4,532,499, Cl. 340-644.000.

Forster, Siegfried; Schindler, Stefan R.; and Keller, Hartmut, to Kernforschungsanlage Julich GmbH; and Rosenthal Technik AG. Ceramic burner head. 4,531,908, Cl. 431-215.000.

Forsyth, John L.: *See*—
Sanders, Royden C., Jr.; and Forsyth, John L., 4,531,848, Cl. 400-124.000.

Forte, Thomas E.; and Parr, Ted K. Extractor for intramedullary fasteners. 4,531,517, Cl. 128-92.0EC.

Fortnagel, Manfred, to Daimler-Benz Aktiengesellschaft. Injection internal combustion engine with supercharging by an exhaust gas turbocharger. 4,531,493, Cl. 123-383.000.

Fortunato, James M.: *See*—
Glamkowski, Edward J.; and Fortunato, James M., 4,532,333, Cl. 548-490.000.

Foshee, William R., to Best Lock Corporation. Cabinet lock. 4,531,389, Cl. 70-372.000.

Foshee, William R.: *See*—
Best, Walter E.; and Foshee, William R., 4,531,390, Cl. 70-372.000.

Foster, Gregory J., to International Business Machines Corporation. Electronic document distribution network with uniform data stream. 4,532,588, Cl. 364-200.000.

Fouilloux, Pierre: *See*—
Cordier, Georges; and Fouilloux, Pierre, 4,532,350, Cl. 564-412.000.

Fourre, Thomas E.: *See*—
Nylander, Eric F.; and Fourre, Thomas E., 4,531,334, Cl. 52-109.000.

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Durand, Daniel; and Grandadam, Yves, 4,532,146, Cl. 426-580.000.

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Fujiyama, Masaaki, 4,532,172, Cl. 428-212.000.
Horikawa, Kazuo, 4,532,429, Cl. 250-559.000.
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Kurata, Masami; and Ohmori, Takashi, 4,532,551, Cl. 358-293.000.

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Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Ether carboxaldehydes. 4,532,364, Cl. 568-444.000.

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Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.

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Nishida, Haruki; and Yano, Yasuhiro, 4,532,468, Cl. 323-367.000.
Shima, Katsuhito; and Hanamitsu, Kiyoshi, 4,532,631, Cl. 372-48.000.
Takasaki, Kanetake; Takagi, Mikio; and Koyama, Kenji, 4,532,022, Cl. 204-192.00D.
Takemae, Yoshihiro; Nakano, Tomio; and Ohira, Tsuyoshi, 4,532,613, Cl. 365-230.000.

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Todoroki, Tsunehiko; Hayakumo, Tadahiko; and Fukuda, Katsumi, 4,531,988, Cl. 148-402.000.

Fukuhara, Akira: *See—*
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Moriya, Yukio; Yoda, Tadashi; and Fukumoto, Hisashi, 4,531,366, Cl. 60-421.000.

Fukushima, Takashi: *See—*
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,531,284, Cl. 29-784.000.

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Fuller, Oliver C.; Bennett, James R.; and Skeen, J. Hall, to Fuller, Oliver C. Method of making tubes. 4,531,666, Cl. 228-171.000.

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Fushimoto, Hideo, to Canon Kabushiki Kaisha. Electronic apparatus having printing mechanism. 4,532,529, Cl. 346-136.000.

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Matthews, John C.; Ury, Michael G.; Wood, Charles H.; and Greenblatt, Marshal, 4,532,427, Cl. 250-492.200.

Futami, Toru: *See—*
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,532,648, Cl. 381-41.000.

Futatsuya, Fumio: *See—*
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Saito, Mikio; and Futatsuya, Fumio, 4,531,964, Cl. 71-92.000.

Futures Unlimited, Inc.: *See—*
Acson, Paul; and Esposito, Anthony, 4,531,310, Cl. 40-1.500.

G. D. Hanna Incorporated: *See—*
Hanna, Gary D., 4,531,564, Cl. 160-351.000.

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Brewer, Stephen J.; and Sassenfeld, Helmut M., 4,532,207, Cl. 435-68.000.
Golant, Victor; Hsia, David; and Taylor, William, Jr., 4,532,155, Cl. 427-213.000.

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Mattei, Riccardo; and Dall'osso, Gastone, 4,531,627, Cl. 198-420.000.
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G Q Games, Inc.: *See—*
Racich, John J., 4,531,642, Cl. 211-42.000.

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Fox, James W.; Moery, Ronald J.; and Banas, Kenneth P., 4,532,394, Cl. 200-275.000.

Gabriele, Leonard A., to Lear Siegler, Inc. Broaching machine. 4,531,868, Cl. 409-269.000.

Gaden, David W.; and Habas, Ted C., to General Motors Corporation. Vehicle body lamp mounting arrangement. 4,532,578, Cl. 362-83.000.

Gafni, Giora: *See—*
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Gaglione, Stanley; and Stangel, John J., to Sperry Corporation. Method and apparatus for accurately setting phase shifters to commanded values. 4,532,518, Cl. 343-372.000.

Gagnon, Richard T., to Votrax, Inc. Speech digitization system. 4,532,495, Cl. 340-347.0DA.

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Magill, Robert J.; Gaiger, David J.; and Simkins, Neil, 4,531,534, Cl. 137-75.000.

Gale, Allan R.; and Chute, Richard, to Eaton Corporation. Pre-start rotor positioner for an electric vehicle. 4,532,460, Cl. 318-139.000.

Gall, John C., to Sears, Roebuck & Co. Coilable device. 4,531,688, Cl. 242-107.300.

Gallone, Cesare, to Signal Lux S.p.A. Diaphragm pressure switch for controlling small pressure gradients. 4,532,390, Cl. 200-83.00B.

Galopin, Fernand. Measured charge dispenser, particularly for powdered material. 4,531,658, Cl. 222-181.000.

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Claunch, Carney P., II; Kridl, Thomas A.; and Gamarra, Jose P., 4,532,164, Cl. 428-36.000.

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Fertier, Marcel; and Cuny, Bernard G., 4,531,610, Cl. 182-5.000.

Gammill, Ronald B., to Upjohn Company, The. Furochromone intermediates. 4,532,340, Cl. 549-471.000.

Gamo, Ryoji: *See—*
Mihara, Yuji; and Gamo, Ryoji, 4,532,600, Cl. 364-565.000.

Gange, Robert A., to RCA Corporation. Cathode structure for a cathodoluminescent display devices. 4,532,452, Cl. 313-346.00R.

Gansert, Willi; Hussmann, Dieter; and Jakob, Gert, to Robert Bosch GmbH. Electrical plug-and-socket connector. 4,531,796, Cl. 339-60.00M.

Garcia, George L.: *See—*
Tisbo, Thomas A.; and Garcia, George L., 4,531,645, Cl. 211-131.000.

Gardner, David L., to Battelle Development Corporation. Dual Microcapsules and process for their preparation. 4,532,123, Cl. 424-21.000.

Gardner, Hugh C., to Union Carbide Corporation. Process for producing low viscosity curable polyester resin compositions. 4,532,296, Cl. 525-48.000.

Gardner, Hugh C., to Union Carbide Corporation. Low viscosity curable polyester resin compositions and a process for the production thereof. 4,532,297, Cl. 525-48.000.

Garrett Corporation, The: *See—*
Linder, Charles G., 4,531,356, Cl. 60-39.020.

Garro, Jose I. P. Change code system in combination padlocks. 4,531,388, Cl. 70-25.000.

Gartner, Karl, to Yoshida Kogyo K. K. Rooftop parapet for thermally-insulated curtain wall. 4,531,332, Cl. 52-58.000.

Gartner, Karl, to Yoshida Kogyo K.K. Mullion portion in a unit type curtain wall. 4,531,336, Cl. 52-209.000.

Gartner, Karl, to Yoshida Kogyo K.K. Plug for use in thermal-medium passages in air conditioning systems. 4,531,550, Cl. 138-89.000.

Gasser, Oswald: *See—*
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Gaston County Dyeing Machine Company: *See—*
Clifford, Graham F., 4,532,036, Cl. 210-167.000.

Gatley, John A.: *See—*
Wearden, Sydney; and Gatley, John A., 4,532,104, Cl. 376-272.000.

Gau, George, to Krones AG Hermann Kronseder Maschinenfabrik. Labeling machine for containers. 4,531,995, Cl. 156-456.000.

Gavrin, Edward S.: *See—*
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Gebelius, Sven R. V. Method to join two elements, and a joint according to the method. 4,531,856, Cl. 403-366.000.

Gebruder Heller Dinklage GmbH Werkzeugfabrik: *See—*
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Geil, Paul H. Down draft kiln. 4,531,910, Cl. 432-120.000.

General Electric Company: *See—*
Corby, Nelson R., Jr.; Lund, Richard M.; and Peroutky, Donald C., 4,532,405, Cl. 219-124.340.
Edelstein, William A., 4,532,474, Cl. 324-309.000.
Erdman, David M.; and Harms, Harold B., 4,532,459, Cl. 318-138.000.
Grondahl, Clayton M., 4,531,889, Cl. 416-96.00R.
Jaquiss, Donald B. G.; McCready, Russell J.; and Tyrell, John A., 4,532,290, Cl. 524-417.000.
Johnson, Robert O., 4,532,054, Cl. 252-12.400.
Kiernan, James G.; Liddell, Robert J.; and Henke, Ronald T., 4,531,535, Cl. 137-99.000.
Lee, Gim F., Jr.; and Williams, Robert A., 4,532,281, Cl. 524-141.000.
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Liu, Ping Y., 4,532,283, Cl. 524-166.000.
Povlick, Thomas P.; and Lund, Richard M., 4,532,406, Cl. 219-124.340.
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General Foods Corporation: *See—*
Jonas, Rodger H.; Beel, Joseph W.; and Lynch, William R., 4,532,147, Cl. 426-655.000.
Saleeb, Fouad Z.; and Pickup, John G., 4,532,145, Cl. 426-650.000.

General Motors Corporation: *See—*
Browne, Alan L., 4,531,607, Cl. 180-282.000.
Dusman, Richard J.; and Nine, Harmon D., 4,531,395, Cl. 72-350.000.
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Hitzelberger, Alan L.; and Shows, Everett W., 4,531,359, Cl. 60-39.270.
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Ludecke, Otto A.; and Stark, Terrence L., 4,531,363, Cl. 60-303.000.
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Rezanka, Richard L.; and Finn, Bernard J., 4,531,759, Cl. 280-668.000.
Schwenk, Wolfgang, 4,531,671, Cl. 237-12.30B.
Shelton, Allan J., 4,532,577, Cl. 362-80.000.
Thompson, Ralph A., 4,532,643, Cl. 377-45.000.
VanCise, Kenneth L., Jr., 4,531,603, Cl. 180-148.000.
Vecellio, Anthony M., 4,532,148, Cl. 427-31.000.
Warwick, Edward H.; and Parker, Donald L., 4,531,276, Cl. 29-417.000.

General Signal Corporation: *See*—
Jandrasi, Frank J.; and Ringle, Eric P., 4,531,539, Cl. 137-375.000.
Pulverenti, John T.; Hentz, Robert S.; and DiPaola, John J., 4,532,509, Cl. 340-825.000.
Ross, Charles W., 4,531,905, Cl. 431-12.000.

Genest, Leonard J. Remote sensor telemetering system. 4,531,526, Cl. 128-630.000.

Genth, Hermann: *See*—
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Georgia Kaolin Company, Inc.: *See*—
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Gerard, Donald R.: *See*—
Otrhalek, Joseph V.; and Gerard, Donald R., 4,531,978, Cl. 148-6.160.

Gerard, Henry M., to United States of America, Army. Chirp transform correlator. 4,532,603, Cl. 364-819.000.

Gerard, Roger E. J., to Marconi Company Limited, The. High power amplifier arrangements. 4,532,480, Cl. 330-286.000.

Gerber, Bernard; and Fellrath, Jean, to Centre Electronique Horologer, S.A. Electrically reprogrammable non volatile memory cell floating gate EEPROM with tunneling to substrate region. 4,532,535, Cl. 357-23.500.

Gerber, Hermann; and Schmutz, Michel, to Sodeco-Saia AG. Rotational restriction lock for the rotor of a synchronous motor. 4,532,444, Cl. 310-41.000.

Gerin, Merlin: *See*—
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Gerson, Fred B. Charcoal lighter device. 4,531,507, Cl. 126-25.00B.

Gessler, Hans, to Schwabische Huttenwerke GmbH. Storage silo for difficultly flowing bulk material. 4,531,876, Cl. 414-325.000.

Ghezel-Ayagh, Hossein G.: *See*—
Baker, Bernard S.; and Ghezel-Ayagh, Hossein G., 4,532,192, Cl. 429-19.000.

Gibson, Dennis H., to Caterpillar Tractor Co. Fuel injection timing and governor control apparatus. 4,531,492, Cl. 123-364.000.

Gibson, Dennis H.: *See*—
Bailey, John M.; Gibson, Dennis H.; Hackett, David E.; Stockner, Alan R.; and Waldman, Donald J., 4,531,494, Cl. 123-450.000.

Gigon, Richard M.: *See*—
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Gilbert, Hubert W., to United States of America, Energy. X-ray focal spot locating apparatus and method. 4,532,646, Cl. 378-207.000.

Gilbert, Lyman F. Monitor system for vertical boilers. 4,531,479, Cl. 122-504.200.

Gilkey, Edward L.: *See*—
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Gilligan, Thomas J., to Ampex Corporation. Low noise core memory sense winding. 4,532,610, Cl. 365-130.000.

Gillis, Richard P., Jr. Percussion stick holder. 4,531,443, Cl. 84-329.000.

Gilmore, George T. Burglar alarm device. 4,532,498, Cl. 340-545.000.

Gilreath, Donald L. Ball expelling device. 4,531,504, Cl. 124-78.000.

Gimber, Gerald A.: *See*—
Haschke, Elliot M.; Gimber, Gerald A.; and Groves, Kenneth O., 4,532,024, Cl. 208-11.0LE.

Ginter, Sally P.: *See*—
Hoenig, Stephen M.; Flores, David P.; and Ginter, Sally P., 4,532,187, Cl. 428-457.000.

Gitlitz, Melvin H.; Russell, David B.; and Leiner, Howard H., to M&T Chemicals Inc. Erodible terpolymer from tributyl tin acrylate or methacrylate and paints for fouling control. 4,532,269, Cl. 523-122.000.

Glamkowski, Edward J.; and Fortunato, James M., to Hoechst-Roussel Pharmaceuticals, Inc. 1-(Aminoalkylphenyl and aminoalkylbenzyl)-indoles and indolines. 4,532,333, Cl. 548-490.000.

Glancy, Jerry L., to Boeing Company, The. Hook latch for an engine cowling. 4,531,769, Cl. 292-113.000.

Glasgo, Marion L. Clamp-on marking template and saw guide for making dovetail joints. 4,531,559, Cl. 144-85.000.

Glennon, Timothy F., to Sundstrand Corporation. Parallel MOSFET power switch circuit. 4,532,443, Cl. 307-575.000.

Gloaguen, Gilbert Y. M., to U.S. Philips Corporation. Output stage for a temperature-compensated integrated E.C.L. circuit. 4,532,441, Cl. 307-455.000.

Global Navigation, Inc.: *See*—
Halvorson, Sheldon J., 4,532,513, Cl. 340-971.000.

Glory Kogyo Kabushiki Kaisha: *See*—
Yonekura, Kenichi; Asami, Kazuto; Hino, Yushi; and Yagi, Katsumi, 4,531,625, Cl. 194-102.000.

Gloskey, Carl R. Process for the preparation of urethane foam. 4,532,262, Cl. 521-127.000.

Glowatzki, Waldemar. Conveyance system. 4,531,628, Cl. 198-432.000.

Goetz, Norbert: *See*—
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Goetze AG: *See*—
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Golant, Victor; Hsia, David; and Taylor, William, Jr., to G. D. Searle & Co. Apparatus and process for coating, granulating and/or drying particles. 4,532,155, Cl. 427-213.000.

Golden, Ruben E.: *See*—
Jackson, Jay W.; and Golden, Ruben E., 4,531,749, Cl. 277-188.00A.

Goldmann, Siegfried: *See*—
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Golia, Dominick, Jr.; and Golia, Kenneth R. Thread take-up arm mechanism for automatic color change embroidery machinery. 4,531,467, Cl. 112-155.000.

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Golia, Dominick, Jr.; and Golia, Kenneth R., 4,531,467, Cl. 112-155.000.

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Colvin, Howard A., 4,532,011, Cl. 203-9.000.
Wendling, Paul R., 4,532,319, Cl. 528-274.000.

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Gordon, Robert T. Device and method for the selective delivery of drugs to the myocardium. 4,531,936, Cl. 604-49.000.

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Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., 4,531,934, Cl. 604-22.000.

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Gottschalk, William: *See*—
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Graco Robotics, Inc.: *See*—
Molaug, Ole, 4,531,885, Cl. 414-735.000.

Grandadam, Yves: *See*—
Durand, Daniel; and Grandadam, Yves, 4,532,146, Cl. 426-580.000.

Granges Metallverken AB: *See*—
Miura, Tatsuo; Ohta, Kazuhiro; Hasegawa, Yoshiharu; and Yoneyama, Takao, 4,531,980, Cl. 148-11.50C.

Granier, Patrick: *See*—
Cunisse, Michel; Granier, Patrick; D'Hollosy, Antoine; and De Pinho, Daniel, 4,531,839, Cl. 366-110.000.

Grant-Acquah, Frank C.: *See*—
Bogner, Ben R.; and Grant-Acquah, Frank C., 4,532,096, Cl. 264-109.000.

Graphic Technology, Inc.: *See*—
McCurdy, Frederic, 4,531,317, Cl. 40-366.000.

Grasselli, Robert K.: *See*—
Suresh, Dev D.; Grasselli, Robert K.; Brazdil, James F.; and Ratka, Frances I., 4,532,083, Cl. 260-465.300.

Gray, George G., to Raytheon Company. Electrical connector. 4,531,799, Cl. 339-75.00M.

Great Lakes Chemical Corporation: *See*—
Cole, Leon M., 4,532,330, Cl. 548-311.000.

Green, Dan; and Goldner, Sandor, to Cynex Manufacturing Corporation. Remote control system for a video computer game. 4,531,740, Cl. 273-148.00B.

Green, Donald R., Jr.; and Moffatt, James P., to AT&T Bell Laboratories. Distortion compensation for a microwave amplifier. 4,532,477, Cl. 330-149.000.

Green, La Thaggar, III: *See*—
Scantlebury, Todd V.; Ambruster, Jeanne B.; Bolton, Carl W.; Campbell, Stephen E.; and Green, La Thaggar, III, 4,531,916, Cl. 433-173.000.

Green, Laddie L., to Stauffer Chemical Company. Herbicide compositions. 4,531,966, Cl. 71-93.000.

Greenblatt, Marshal: *See*—
Matthews, John C.; Ury, Michael G.; Wood, Charles H.; and Greenblatt, Marshal, 4,532,427, Cl. 250-492.200.

Greer, Charles L., Jr.: *See*—
Ducote, Marjorie E.; and Greer, Charles L., Jr., 4,531,989, Cl. 149-19.200.

Gregor, Heinz-Dieter: *See—*
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,532,428, Cl. 250-507.100.

Grieco, Michael J.; and Hale, Laura P., to AT&T Bell Laboratories. Device lithography using multi-level resist systems. 4,532,005, Cl. 156-661.100.

Griffith, James B.; and Sanborn, Harold C., to United Technologies Corporation. Method for the manufacture of metal vanes for turbomachinery. 4,531,270, Cl. 29-156.80B.

Grinde, James E. Gauge for indicating quantity of mixture components to be added to a tank. 4,531,293, Cl. 33-126.70R.

Grob, Ferdinand: *See—*
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; and Reber, Harald, 4,532,013, Cl. 204-1.00T.

Groeneweg, Ronald L. Manure spreader. 4,531,680, Cl. 239-676.000.

Groenewegen, Willem F. M., to U.S. Philips Corporation. High channel density community antenna arrangement having low intermodulation products. 4,532,543, Cl. 358-86.000.

Grondahl, Clayton M., to General Electric Co. Cooling system utilizing flow resistance devices to distribute liquid coolant to air foil distribution channels. 4,531,889, Cl. 416-96.00R.

Groose, James E.; and Liu, Paul K. T., to Calgon Corporation. Sublimation of amine compounds on activated carbon pore surfaces. 4,531,953, Cl. 55-74.000.

Grossner, Horst: *See—*
Weiger, Gunter; Schwerdt, Paul; and Grossner, Horst, 4,531,706, Cl. 251-25.000.

Grothe, Wolfgang: *See—*
Brill, Klaus; and Grothe, Wolfgang, 4,532,181, Cl. 428-336.000.

Groves, Kenneth O.: *See—*
Haschke, Elliot M.; Gimber, Gerald A.; and Groves, Kenneth O., 4,532,024, Cl. 208-11.0LE.

Grubel, Gerhard: *See—*
Teubner, Herbert; Kramer, Axel; Weuffen, Wolfgang; Schrotter, Eberhard; and Grubel, Gerhard, 4,532,367, Cl. 568-745.000.

Grumet, F. Carl: *See—*
Ullman, Edwin F.; and Grumet, F. Carl, 4,532,203, Cl. 435-7.000.

Grumman Aerospace Corporation: *See—*
Berger, Saul H., 4,531,241, Cl. 2-161.00R.

Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Diederich, Gerd, to Mannesmann AG. Injection and feeder pipe for apparatus for continuous casting of steel. 4,531,567, Cl. 164-415.000.

Gryspeerdt, Jose G. T.: *See—*
De Vilder, Rudy J. C.; and Gryspeerdt, Jose G. T., 4,531,348, Cl. 56-11.600.

GTE Automatic Electric Incorporated: *See—*
Pommer, Karl E., II, 4,532,382, Cl. 179-81.00R.
Reimer, William A., 4,532,576, Cl. 361-415.000.
Renner, Robert E., 4,532,624, Cl. 370-13.000.

GTE Laboratories Incorporated: *See—*
Abdalla, Mohamed I., 4,532,454, Cl. 313-506.000.
Carlsen, W. John, 4,531,810, Cl. 350-96.200.
Carter, Gary M.; Chen, Yung-Jui; and Tripathy, Sukant K., 4,531,809, Cl. 350-96.190.

GTE Products Corporation: *See—*
Knoll, William C.; and Bay, David L., 4,532,456, Cl. 315-223.000.
Mizuhara, Howard, 4,531,502, Cl. 123-668.000.

Gueldenzopf, Thomas D., to S. C. Johnson & Son, Inc. Dissolvable bleach sheet. 4,532,063, Cl. 252-90.000.

Gueussier, Andre ; and Vachiery, Edmond, to Vallourec. Method for the fabrication of steels with high machinability. 4,531,972, Cl. 75-58.000.

Guillot, Jean: *See—*
Raynaud, Jacques; Darmois, Jean; Jolivet, Pierre; and Guillot, Jean, 4,531,693, Cl. 244-52.000.

Gundry, Kenneth J., to Dolby Laboratories Licensing Corporation. Time-base correction of audio signals in video tape recorders. 4,532,556, Cl. 360-19.100.

Gunter, James C., to Robertshaw Controls Company. Method of making a leakproof joint. 4,531,279, Cl. 29-509.000.

Gust, Ian D.: *See—*
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,532,215, Cl. 435-237.000.

Guttag, Karl M.: *See—*
Roskell, Derek; Schabowski, John V.; Guttag, Karl M.; and McDonough, Kevin C., 4,532,587, Cl. 364-200.000.

Guyon, Gerard E. Drink dispensing device. 4,531,654, Cl. 222-78.000.

Guzman, Angel: *See—*
Muchowski, Joseph M.; and Guzman, Angel, 4,532,138, Cl. 514-369.000.

Gyokhegyi, Laszlo : *See—*
Boronyak, Imre; and Gyokhegyi, Laszlo , 4,532,087, Cl. 261-114.0JP.

Habas, Ted C.: *See—*
Gaden, David W.; and Habas, Ted C., 4,532,578, Cl. 362-83.000.

Haberey, Martin: *See—*
Nickolson, Robert; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; and Haberey, Martin, 4,532,236, Cl. 514-184.000.

Hackett, David E.: *See—*
Bailey, John M.; Gibson, Dennis H.; Hackett, David E.; Stockner, Alan R.; and Waldman, Donald J., 4,531,494, Cl. 123-450.000.

Hackney Brothers Body Company, Inc.: *See—*
Boykin, Royce B., 4,531,278, Cl. 29-469.000.

Hadden, Edward H. Miniaturized valve. 4,531,547, Cl. 137-625.640.

Haefliger, William W.: *See—*
Kapralis, Imants P.; and Krukle, Harry, 4,532,110, Cl. 422-245.000.

Haferl, Peter E., to RCA Corporation. Television receiver standby circuit. 4,532,457, Cl. 315-411.000.

Hafner, Edmund W.; and Jackson, Denise M., to UOP Inc. Constitutive glucose isomerase producer. 4,532,208, Cl. 435-94.000.

Haga, Shozi: *See—*
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,531,420, Cl. 74-467.000.
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,531,623, Cl. 192-82.00R.
Takahasi, Yasuie; and Haga, Shozi, 4,531,418, Cl. 74-339.000.

Haga, Tsunehiro: *See—*
Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, 4,532,105, Cl. 420-451.000.

Hagedorn, Scott, to Celanese Corporation. Production of para-cresol. 4,532,209, Cl. 435-156.000.

Hagen, Donald F.; and Marhevka, John S., to Minnesota Mining and Manufacturing Company. High frequency radiation-induced plasma analysis of volatile or non-volatile materials. 4,532,219, Cl. 436-155.000.

Hagen, William F., to Turbo Refrigerating Company. Ice making machine. 4,531,380, Cl. 62-320.000.

Hahn, Norbert: *See—*
Swessel, Michael A.; and Hahn, Norbert, 4,531,248, Cl. 14-71.300.

Haider, Erich: *See—*
Lagger, Helmut; Schmid, Elisabeth; and Haider, Erich, 4,532,638, Cl. 375-17.000.

Hait, Paul W.; and Rohrer, Dan, to Pyromid, Inc. Convertible cooking unit with an oven. 4,531,505, Cl. 126-9.00R.

Halbritter, Klaus: *See—*
Eckhardt, Heinz; Halbritter, Klaus; Goetz, Norbert; and Heilen, Gerd, 4,532,337, Cl. 549-425.000.

Halcon SD Group, Inc., The: *See—*
Khoobiar, Sargis, 4,532,365, Cl. 568-479.000.

Hale, Laura P.: *See—*
Grieco, Michael J.; and Hale, Laura P., 4,532,005, Cl. 156-661.100.

Hall, Gaddis G. Guy attaching device for attachment to a utility line pole. 4,531,263, Cl. 24-115.00K.

Hall, Roger E. Fastener and base using said fastener. 4,531,733, Cl. 273-25.000.

Halliburton Company: *See—*
Revett, Lowell W., 4,531,583, Cl. 166-253.000.
Weaver, Jimmie D.; Harris, Lawrence E.; and Harms, Weldon M., 4,532,052, Cl. 252-8.55R.

Halluin, Albert P.: *See—*
Barnett, Allan E.; and Halluin, Albert P., 4,532,351, Cl. 564-415.000.

Halvorson, Sheldon J., to Global Navigation, Inc. Aircraft navigation computer display. 4,532,513, Cl. 340-971.000.

Hamada, Koushi: *See—*
Kawai, Hideki; Nishihara, Hidetoshi; Nakaoka, Seishi; and Hamada, Koushi, 4,531,894, Cl. 417-312.000.

Hamamoto, Nobuo: *See—*
Nomura, Setsuo; Tonomura, Akira; Hamamoto, Nobuo; and Fukuhara, Akira, 4,532,422, Cl. 250-306.000.

Hamas, Robert S. Mammary prosthesis with multiple flow spaces. 4,531,244, Cl. 623-8.000.

Hamashima, Yoshio: *See—*
Tsuji, Teruji; Sato, Hisao; and Hamashima, Yoshio, 4,532,233, Cl. 514-63.000.

Hampton, Willie E. Method and apparatus for tufting multiple yarns to produce a differently colored pattern. 4,531,465, Cl. 112-79.00A.

Hanak, Joseph J.; and Nostrand, Gerald E., to RCA Corporation. Series-connected photovoltaic array and method of making same. 4,532,371, Cl. 136-249.000.

Hanamitsu, Kiyoshi: *See—*
Shima, Katsuhiio; and Hanamitsu, Kiyoshi, 4,532,631, Cl. 372-48.000.

Hanano Commerical Co., Ltd.: *See—*
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.

Hancock, Curtis L.: *See—*
Morris, James A.; Hancock, Curtis L.; and Wiley, John L., 4,532,642, Cl. 377-15.000.

Hancock, Henry. Fire retardant polyolefin fibers and fabrics. 4,532,278, Cl. 524-101.000.

Handler, Anthony. Device for holding sheets provided with perforations. 4,531,854, Cl. 402-27.000.

Handte, Reinhard: *See—*
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.

Hanna, Gary D., to G. D. Hanna Incorporated. Panel display. 4,531,564, Cl. 160-351.000.

Hanna, Marie R.: *See—*
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,532,357, Cl. 568-327.000.

Hans, Lindqvist; and Vidar, Gronberg, to Linot.k, Oy. Continuously operating separating apparatus for the separation of mixtures of light and heavy liquid components. 4,532,034, Cl. 210-112.000.

Hansen, Asger. Safety shear apparatus and method for production wells. 4,531,585, Cl. 166-297.000.

Hansen, Charles C., Sr.: *See—*
Stoughton, Alan M.; Hansen, Charles C., Sr.; Leahy, John P.; and Millar, Robert F., 4,531,826, Cl. 355-14.0CU.

Hansen, David G.: *See*—
Poole, Forrest R.; and Hansen, David G., 4,531,516, Cl. 128-89.00R.
Hanson, Bruce L.: *See*—
Wolvek, Sidney; Hanson, Bruce L.; and Lucas, John J., 4,531,512, Cl. 128-1.00D.
Hanson, Lowell C. Subteranean surveying apparatus. 4,532,545, Cl. 358-100.000.
Hanyu, Susumu; and Kato, Kenji, to Janome Sewing Machine Co. Ltd. Computer sewing machine with response function as to the usage thereof. 4,531,466, Cl. 112-121.110.
Hara, Minoru, to Kabushiki Kaisha Kubota Seisakusho. Bucket for use in centrifugal separators. 4,531,652, Cl. 220-83.000.
Harima, Hiroshi: *See*—
Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, 4,532,298, Cl. 525-96.000.
Harms, Harold B.: *See*—
Erdman, David M.; and Harms, Harold B., 4,532,459, Cl. 318-138.000.
Harms, Weldon M.: *See*—
Weaver, Jimmie D.; Harris, Lawrence E.; and Harms, Weldon M., 4,532,052, Cl. 252-8.55R.
Harrington, James A.; Pastor, Antonio C.; Standlee, Arlie G.; and Turk, Roger R., to Hughes Aircraft Company. Fabrication of single crystal fibers from congruently melting polycrystalline fibers. 4,532,000, Cl. 156-620.000.
Harris Corporation: *See*—
Beasom, James D., 4,532,003, Cl. 156-648.000.
Meza, Peter J.; and de la Plaza, Alex, 4,532,481, Cl. 330-288.000.
Harris, David W. Pool table rail-mirror. 4,531,732, Cl. 273-14.000.
Harris, Lawrence E.: *See*—
Weaver, Jimmie D.; Harris, Lawrence E.; and Harms, Weldon M., 4,532,052, Cl. 252-8.55R.
Harry Soder & Son Stenhuggeri AB: *See*—
Soder, Sven-Harry, 4,531,720, Cl. 269-71.000.
Hart, Cullen P.; and Klopfenstein, Wayne A., to Caterpillar Tractor Co. Debris deflector for endless track system. 4,531,787, Cl. 305-12.000.
Harteman, Evert, to Akzo NV. Process for making a sized multifilament yarn of an aromatic polyamide. 4,532,154, Cl. 427-175.000.
Hartman, George D.; and Phillips, Brian T., to Merck & Co., Inc. Substituted and bridged pyridines useful as calcium channel blockers. 4,532,237, Cl. 514-226.000.
Hartmann, Heinrich: *See*—
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Rauben Heimer, Hans-Juergen, 4,532,320, Cl. 528-498.000.
Hartner, Hartmut, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of [2,2]-paracyclophane. 4,532,369, Cl. 585-428.000.
Hartshorn, Kevin, to Ingersoll-Rand Company. Plate-type valve, and an improved valve seat and a valve seat assembly therefor. 4,531,541, Cl. 137-514.000.
Harvey Hubbell Incorporated: *See*—
Neuroth, David H., 4,532,374, Cl. 174-103.000.
Haschke, Elliot M.; Gimber, Gerald A.; and Groves, Kenneth O., to Dow Chemical Company, The. Process for recovery of solvent from tar sand bitumen. 4,532,024, Cl. 208-11.0LE.
Hasegawa, Yoshiharu: *See*—
Miura, Tatsuo; Ohta, Kazuhiro; Hasegawa, Yoshiharu; and Yoneyama, Takao, 4,531,980, Cl. 148-11.50C.
Haselbauer, Franz: *See*—
Weber, Thomas; and Haselbauer, Franz, 4,531,357, Cl. 60-39.070.
Hashimoto, Takashi; and Igarashi, Chikara, to Mitsui Petrochemical Industries Ltd. Poly-1-butene resin composition. 4,532,165, Cl. 428-36.000.
Hashimoto, Yuji, to Namba Press Works Co., Ltd. Automotive seat with lumbar support. 4,531,779, Cl. 297-284.000.
Hassler, Heinrich: *See*—
Freller, Helmut; Hassler, Heinrich; Schack, Peter; and Schultz, Ludwig, 4,532,174, Cl. 428-215.000.
Hata, Nobuhiro: *See*—
Matsuura, Hideharu; Tanaka, Kazunobu; Matsuda, Akihisa; Okushi, Hideyo; Oheda, Hidetoshi; Yamasaki, Satoshi; and Hata, Nobuhiro, 4,532,373, Cl. 136-258.000.
Hatanaka, Katsunori; and Uzawa, Shunichi, to Canon Kabushiki Kaisha. Photo-electric transducer. 4,532,536, Cl. 357-30.000.
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, to Alps Electric Co., Ltd. Course guidance system with speeded-up display function. 4,532,514, Cl. 340-995.000.
Haub, Martin: *See*—
Rau, Karl; and Haub, Martin, 4,532,491, Cl. 338-33.000.
Hauger, Josef: *See*—
Madge, Werner; Vogelhuber, Peter; Stellmach, Dieter; and Hauger, Josef, 4,531,852, Cl. 400-692.000.
Haverstock, Charles B. Skin closure means. 4,531,521, Cl. 128-335.000.
Hawkins, William G., to Xerox Corporation. Bubble jet printing device. 4,532,530, Cl. 346-140.00R.
Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,532,312, Cl. 526-119.000.
Hayakumo, Tadahiko: *See*—
Todoroki, Tsunehiko; Hayakumo, Tadahiko; and Fukuda, Katsumi, 4,531,988, Cl. 148-402.000.
Hayashi, Junnosuke; Tanibuchi, Teruo; and Yamamoto, Shinji, to UBE Industries, Ltd. Bead filler rubber composition. 4,532,291, Cl. 524-496.000.
Hayashi, Koichi: *See*—
Shibata, Minoru; Hayashi, Koichi; and Abe, Katsumi, 4,531,287, Cl. 30-43.600.
Hayashi, Yoshikazu: *See*—
Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, 4,531,705, Cl. 249-134.000.
Hayatdavoudi, Asadollah. Jet nozzle. 4,531,592, Cl. 75-67.000.
Haynes, Nolan F., to Casebolt, James E., Jr.; and Casebolt, Barion. Rotary cylinder diesel engine. 4,531,481, Cl. 123-44.00R.
Hazel, Michael E., to Eaton Corporation. Flow control valve for fluid fan drive. 4,531,621, Cl. 192-58.00B.
Hebrant, Georges, to Kaiser Aluminum & Chemical Corporation. Preheated trough for molten metal transfer. 4,531,717, Cl. 266-166.000.
Hefferon, James E.: *See*—
O'Malley, Michael P.; Henderson, David E.; Cable, Mark J.; and Hefferon, James E., 4,532,093, Cl. 264-40.100.
Heidel, Jeffrey C.; and Swartz, Harold L., to Sperry Corporation. Electronic inclination gauge with acceleration compensation. 4,531,300, Cl. 33-366.000.
Heidemeyer, Paulus: *See*—
Scholz, Romanus; Heidemeyer, Paulus; and Hofbauer, Peter, 4,531,605, Cl. 180-165.000.
Heil Company, The: *See*—
Boczkiewicz, Bruce M., 4,531,780, Cl. 298-17.600.
Heilen, Gerd: *See*—
Buschmann, Ernst; Schulz, Guenter; Heilen, Gerd; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,532,234, Cl. 514-63.000.
Eckhardt, Heinz; Halbritter, Klaus; Goetz, Norbert; and Heilen, Gerd, 4,532,337, Cl. 549-425.000.
Heinz, Harro K. High frequency compression driver. 4,531,608, Cl. 181-172.000.
Helwing, Robert F., to SRI International. Preparation of ketene acetals by rearrangement of allyl and substituted allyl acetals. 4,532,335, Cl. 549-335.000.
Hemmings, Davis L., to United States of America, Army. Retractable tie-down device. 4,531,869, Cl. 410-107.000.
Henderson, David E.: *See*—
O'Malley, Michael P.; Henderson, David E.; Cable, Mark J.; and Hefferon, James E., 4,532,093, Cl. 264-40.100.
Hendrickson, Richard T.; and Lohraff, Larry G., to Bendix Corporation, The. Brake actuation assembly. 4,531,370, Cl. 60-554.000.
Henk, Keith L., to Pako Corporation. Web tension and break sensor system for photosensitive web processors. 4,532,500, Cl. 340-675.000.
Henke, Ronald T.: *See*—
Kiernan, James G.; Liddell, Robert J.; and Henke, Ronald T., 4,531,535, Cl. 137-99.000.
Henkel Corporation: *See*—
Maier, Helmut K., 4,532,314, Cl. 526-200.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Schmid, Karl; Baumann, Horst; and Rommerskirchen, Hans J., 4,532,076, Cl. 252-557.000.
Henn, Robert L., to W. L. Gore & Assoc., Inc. Phase separating polyurethane prepolymers and elastomers prepared by reacting a polyol having a molecular weight of 600–3500 and isocyanate and a low molecular weight chain extender in which the ratios of reactants have a limited range. 4,532,316, Cl. 528-59.000.
Henning, Peter J. Toy glider system. 4,531,323, Cl. 446-66.000.
Henningsgaard, Russell W. Fruit picker with stem cutting jaws. 4,531,352, Cl. 56-336.000.
Henriksson, Bengt, to ASEA Aktiebolag. Induction coil. 4,532,398, Cl. 219-10.790.
Henry, Carl: *See*—
Wallach, Steven; Holberger, Kenneth D.; Staudaner, Steven M.; and Henry, Carl, 4,532,590, Cl. 364-200.000.
Henry Ford Hospital: *See*—
Zasuwa, Gerard A., 4,531,941, Cl. 604-113.000.
Hentz, Robert S.: *See*—
Pulverenti, John T.; Hentz, Robert S.; and DiPaola, John J., 4,532,509, Cl. 340-825.000.
HEP Products AB: *See*—
Stenlund, Stig, 4,532,151, Cl. 427-54.100.
Herd, Richard S.: *See*—
Horodysky, Andrew G.; and Herd, Richard S., 4,532,056, Cl. 252-49.600.
Herrero, Maria P.: *See*—
Van Heertum, John C.; and Herrero, Maria P., 4,531,967, Cl. 71-94.000.
Herrick, Robert M. Tennis practice device. 4,531,734, Cl. 273-29.00A.
Herrington, F. John, to Mobil Oil Corporation. Plastic bag with air exhaustion valve. 4,532,652, Cl. 383-103.000.
Herrington, Maurice G., to Payen International Limited. Layered gasket with double eyelet construction. 4,531,750, Cl. 277-235.00B.
Heshmat, Hooshang, to Reliance Electric Company. Bearing lubrication device. 4,531,845, Cl. 384-406.000.
Heuberger, Glen L.: *See*—
Johnson, Gary M.; and Heuberger, Glen L., 4,531,518, Cl. 128-303.100.
Heverly, Karen H. Electrical outlet safety fixture. 4,531,794, Cl. 339-39.000.
Heyes, Graham: *See*—
Jackson, Arthur; and Heyes, Graham, 4,532,322, Cl. 544-54.000.
Hicks, John W., Jr., to Polaroid Corporation. Fiber optics polarizer. 4,531,811, Cl. 350-96.330.

Hicks, W. Glen. Method and apparatus for varying a vehicle wheelbase. 4,531,753, Cl. 280-80.00B.

Higgs, Bruce S.: *See—*
Ng, Fook L.; and Higgs, Bruce S., 4,532,032, Cl. 209-166.000.

Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, to Hitachi, Ltd. Device for stopping the swinging movement of a load hung by a crane. 4,531,647, Cl. 212-147.000.

Hikita, Katuro: *See—*
Uzaki, Nagato; Matui, Kazuharu; Toyoda, Shigehiro; and Hikita, Katuro, 4,531,565, Cl. 164-160.100.

Hileman, Kenneth R.; Shields, Ronald H.; and Tobey, Lance M., to Lynch Machinery. Modular section molding press and mold clamping and article removal mechanism therefor. 4,531,961, Cl. 65-164.000.

Hilvenna Limited: *See—*
Saxby, Michael E., 4,531,458, Cl. 102-440.000.

HIMONT Incorporated: *See—*
Matlack, Albert S., 4,532,313, Cl. 526-125.000.

Hino, Yushi: *See—*
Yonekura, Kenichi; Asami, Kazuto; Hino, Yushi; and Yagi, Katsumi, 4,531,625, Cl. 194-102.000.

Hirabayashi, Masao; and Mizutani, Takeshi, to Shachihata Industry Co., Ltd. Writing instrument with a metal wire point. 4,531,853, Cl. 401-265.000.

Hiraiwa, Kazuyoshi; and Kawaguchi, Akio, to Nissan Motor Co., Ltd. Gear shift mechanism for transmission. 4,531,424, Cl. 74-477.000.

Hiraki, Shunichi: *See—*
Akiyama, Tatsuo; Koshino, Yutaka; and Hiraki, Shunichi, 4,532,004, Cl. 156-653.000.

Hirohashi, Kazutoshi: *See—*
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, 4,532,475, Cl. 328-165.000.

Hirokawa, Noboru: *See—*
Okoh, Tomio; Matsumoto, Tomoaki; and Hirokawa, Noboru, 4,531,893, Cl. 417-220.000.

Hiron, Thierry: *See—*
Madsac, Michel; and Hiron, Thierry, 4,531,984, Cl. 148-16.600.

Hirosawa, Shigeru: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Hirose, Masataka: *See—*
Ueno, Tsuyoshi; Suzuki, Katsumi; and Hirose, Masataka, 4,532,199, Cl. 430-128.000.

Hishinuma, Yukio: *See—*
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, 4,531,949, Cl. 48-202.000.

Hislop, Thomas H., to Plessey Overseas Limited. Target detection systems. 4,532,520, Cl. 343-373.000.

Hitachi Construction Machinery Co., Ltd.: *See—*
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4.531,369, Cl. 60-456.000.

Hitachi Denshi Engineering Kabushiki Kaisha: *See—*
Sato, Koji; and Kawano, Hikaru, 4,531,344, Cl. 53-447.000.

Hitachi Engineering Co., Ltd.: *See—*
Kajiyama, Shigeru; Takaku, Kazuo; Naruse, Akisuke; and Akasu, Akira, 4,531,663, Cl. 228-29.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, 4,532,464, Cl. 318-807.000.

Hitachi, Ltd.: *See—*
Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, 4,531,647, Cl. 212-147.000.
Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, 4,532,464, Cl. 318-807.000.
Kajiyama, Shigeru; Takaku, Kazuo; Naruse, Akisuke; and Akasu, Akira, 4,531,663, Cl. 228-29.000.
Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, 4,532,561, Cl. 360-73.000.
Kitaguchi, Hiroshi; Kudo, Masashi; and Fujii, Masaaki, 4,532,103, Cl. 376-245.000.
Kitazima, Masaaki; and Kawakami, Hideaki, 4,532,506, Cl. 340-784.000.
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, 4,531,949, Cl. 48-202.000.
Mouri, Yasunori; Abe, Osamu; and Teragakiuchi, Akira, 4,532,593, Cl. 364-431.110.
Nogami, Taro, 4,531,834, Cl. 356-73.000.
Nomura, Setsuo; Tonomura, Akira; Hamamoto, Nobuo; and Fukuhara, Akira, 4,532,422, Cl. 250-306.000.
Oguino, Masanori, 4,531,812, Cl. 350-128.000.
Ohta, Norio; Ando, Keikichi; Hosoe, Yuzuru; Sugita, Yutaka; and Ishida, Fumihiko, 4,532,180, Cl. 428-336.000.
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.
Shibayama, Akinori; Fujinami, Minpai; and Yoda, Haruo, 4,532,598, Cl. 364-491.000.
Shintani, Yoichi; Wada, Kenichi; Shimizu, Tsuguo; and Yamaoka, Akira, 4,532,589, Cl. 364-200.000.
Sugiyama, Toshio; and Suenaga, Hideo, 4,532,619, Cl. 369-106.000.
Tsuchita, Kenji; Domon, Kozo; and Takahashi, Fuminobu, 4,531,413, Cl. 73-637.000.
Tsunoda, Yoshito; Maeda, Takeshi; Nakamura, Shigeru; and Kaku, Toshimitsu, 4,532,522, Cl. 346-44.000.

Hitzelberger, Alan L.; and Shows, Everett W., to General Motors Corporation. Gas turbine engine fuel system. 4,531,359, Cl. 60-39.270.

Hnatchenko, Michael: *See—*
Feinland, Raymond; Pohl, Stanley; and Hnatchenko, Michael, 4,532,127, Cl. 424-62.000.

Ho, Bin-Lun: *See—*
Larson, Bert R.; Wartenbergh, Robert P.; Warszawski, Janusz; Meier, Markus; Sutton, David A.; Ho, Bin-Lun; and Bronshvatch, Efim, 4,532,564, Cl. 360-97.000.

Hobbs, Peter D.: *See—*
Dawson, Marcia I.; and Hobbs, Peter D., 4,532,343, Cl. 514-543.000.

Hoch, John J., to Deere & Company. Mounting connecting an oil cooler to a radiator. 4,531,574, Cl. 165-67.000.

Hochberg, Nelson D. Means for controlling heat flux. 4,531,511, Cl. 126-450.000.

Hochgesang, Gerhard, to Preh Elektrofeinmechanische Werke Jakob Preh Nach. GmbH & Co. Multipole edge strip connector. 4,531,793, Cl. 339-17.00F.

Hoechst Aktiengesellschaft: *See—*
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.
Rehn, Karl; and Nestler, Hans J., 4,532,346, Cl. 562-471.000.
Siegemund, Gunter; and Schwertfeger, Werner, 4,532,366, Cl. 568-615.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Glamkowski, Edward J.; and Fortunato, James M., 4,532,333, Cl. 548-490.000.

Hoefle, Milton L.; and Klutchko, Sylvestor, to Warner-Lambert Company. N-substituted amino acids as intermediates in the preparation of acyl derivatives of 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acids. 4,532,342, Cl. 560-38.000.

Hoenig, Stephen M.; Flores, David P.; and Ginter, Sally P., to Dow Chemical Company, The. Polyolefin resin blends with enhanced adhesion and laminates. 4,532,187, Cl. 428-457.000.

Hoenig, Stephen M.: *See—*
Lancaster, Gerald M.; and Hoenig, Stephen M., 4,532,100, Cl. 264-564.000.

Hoesch Werke Aktiengesellschaft: *See—*
Koch, Friedrich-Otto; and Wahl, Hans-Jurgen, 4,531,409, Cl. 73-588.000.

Hofbauer, Peter: *See—*
Scholz, Romanus; Heidemeyer, Paulus; and Hofbauer, Peter, 4,531,605, Cl. 180-165.000.

Hoffman, Gary R., to Du Pont de Nemours, E. I., and Company. Capacitively coupled machine tool safety system. 4,532,501, Cl. 340-679.000.

Hoffman, Leo: *See—*
Linkow, Leonard I.; and Hoffman, Leo, 4,531,917, Cl. 433-176.000.

Hoffmann-La Roche Inc.: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,532,355, Cl. 568-9.000.
Kompis, Ivan, 4,532,245, Cl. 514-275.000.
Lukac, Teodor; Soukup, Milan; and Widmer, Erich, 4,532,358, Cl. 568-341.000.

Hofmann, Karl: *See—*
Seifert, Kurt; and Hofmann, Karl, 4,531,676, Cl. 239-453.000.

Hokkai Can Co., Ltd.: *See—*
Toriyabe, Tetsuo; Ooya, Kunihiko; Nogami, Akira; and Sugawara, Kazunori, 4,531,626, Cl. 198-347.000.

Holben, Wilbur D.: *See—*
Wolf, Jerry M.; and Holben, Wilbur D., 4,531,609, Cl. 181-290.000.

Holberger, Kenneth D.: *See—*
Wallach, Steven; Holberger, Kenneth D.; Staudaner, Steven M.; and Henry, Carl, 4,532,590, Cl. 364-200.000.

Holdiman, Joseph W. Door casement. 4,531,337, Cl. 52-217.000.

Holland, Hugh R.; and Adamo, Rosario, to Pennwalt Corporation. Spray jet polymer powder wetter. 4,531,673, Cl. 239-113.000.

Hollman, Nils D. Hinge-type angle setting device. 4,531,417, Cl. 74-96.000.

Holmens Bruk Aktiebolag: *See—*
Noren, Per-Olle, 4,532,007, Cl. 162-161.000.

Holmes, Russell C., to Eaton Corporation. Throttle modulator. 4,531,430, Cl. 74-858.000.

Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Oxirane compounds. 4,532,341, Cl. 549-559.000.

Holstein, Alfred H.: *See—*
Abubakari, Allassan; and Holstein, Alfred H., 4,532,318, Cl. 528-483.000.

Holtrop, James S.; and Maurer, Richard P., to Monsanto Company. Process for preparing a thermoformable laminate structure. 4,531,994, Cl. 156-307.300.

Holy, Zdenek: *See—*
Rosenbaum, Stanley D.; and Holy, Zdenek, 4,532,381, Cl. 179-18.0FA.

Holz, George E.; and Ogle, James A., to Burroughs Corporation. Gas-filled dot matrix display panel. 4,532,505, Cl. 340-775.000.

Hom, Foo S.: *See—*
Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., 4,532,126, Cl. 424-48.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ikenoya, Yasuo, 4,531,928, Cl. 474-93.000.
Isono, Tokio; and Tsunoda, Kazuhiko, 4,531,755, Cl. 280-277.000.

Kishi, Noriyuki; Koumura, Takashi; and Hosokawa, Takehiko, 4,531,490, Cl. 123-339.000.
Sakata, Yoshiyasu, 4,531,653, Cl. 220-85.00S.
Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, 4,531,762, Cl. 280-801.000.
Yagasaki, Akio; and Takenaka, Masahiko, 4,531,255, Cl. 15-250.010.
Yamato, Akihiro; and Otobe, Yutaka, 4,531,495, Cl. 123-479.000.

Honeywell Inc.: *See*—
Royer, Michele, 4,531,267, Cl. 29-25.350.

Honeywell Lucifer SA: *See*—
Livet, Jean, 4,531,708, Cl. 251-48.000.

Hongu, Tatsuhiko: *See*—
Endo, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Ueno, Susumu, 4,532,150, Cl. 427-39.000.

Honma, Kazuo: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,531,369, Cl. 60-456.000.

Hook, John A.: *See*—
Cohen, Leon E.; and Hook, John A., 4,532,065, Cl. 252-135.000.

Hoos, Robert G.: *See*—
Larronde, Michael L.; and Hoos, Robert G., 4,531,579, Cl. 166-66.000.

Hopf, Heinrich: *See*—
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,532,295, Cl. 524-827.000.

Hoppie, Lyle O.; and Chute, Richard, to Eaton Corporation. Elastomeric member for energy storage device. 4,531,719, Cl. 267-57.10R.

Hoppie, Lyle O., to Eaton Corporation. Elastomeric member. 4,532,163, Cl. 428-36.000.

Hori, Saburo, to Kureha Chemical Industry Co., Ltd. Composite ceramic powders and a method of making the same. 4,532,224, Cl. 501-105.000.

Horie, Tokunaru: *See*—
Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, 4,532,254, Cl. 514-456.000.

Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Method and apparatus for detecting the leading edge of a sheet to be scanned. 4,532,429, Cl. 250-559.000.

Horimoto, Rioichi, to TDK Corporation. Tape cassette. 4,532,566, Cl. 360-132.000.

Horlein, Gerhard: *See*—
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.

Horne, Ottis J.: *See*—
Short, Lewis A.; and Horne, Ottis J., 4,532,182, Cl. 428-367.000.

Horodysky, Andrew G.; and Herd, Richard S., to Mobil Oil Corporation. Lubricant composition containing a boron reaction product. 4,532,056, Cl. 252-49.600.

Horodysky, Andrew G.; and Landis, Phillip S., to Mobil Oil Corporation. Lubricant composition comprising the reaction product of a vicinal diol and a dihydrocarbyl phosphite. 4,532,057, Cl. 252-49.800.

Horowitz, Isadore. Boat loading and carrying device. 4,531,879, Cl. 414-462.000.

Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, to Nissan Motor Company, Limited. Multiple microcomputer system with comonitoring/back-up for an automotive vehicle. 4,532,594, Cl. 364-431.110.

Hoshino, Osamu, to Canon Kabushiki Kaisha. Image receiving member conveying device of a multiplex image forming apparatus. 4,531,828, Cl. 355-3.0SH.

Hosoe, Yuzuru: *See*—
Ohta, Norio; Ando, Keikichi; Hosoe, Yuzuru; Sugita, Yutaka; and Ishida, Fumihiko, 4,532,180, Cl. 428-336.000.

Hosogai, Takeo: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.

Hosokawa, Takehiko: *See*—
Kishi, Noriyuki; Koumura, Takashi; and Hosokawa, Takehiko, 4,531,490, Cl. 123-339.000.

Houseman, Barton L.: *See*—
Elliott, Guy R. B.; McDaniel, Milton W.; and Houseman, Barton L., 4,531,593, Cl. 175-71.000.

Housman, Robert J. Wear resistant composite insert and boring tool with insert. 4,531,595, Cl. 175-329.000.

Howard, Fred; Edson, Sydney; Merl, Milton J.; and Di Marchi, Silvio J., to Marlboro Marketing, Inc. Data information display device. 4,531,311, Cl. 40-10.00R.

Howard, Fred, to Consolidated Foods Corporation. Product display rack. 4,531,646, Cl. 211-150.000.

Howard, Ross K.: *See*—
Wolfe, Lewis E.; and Howard, Ross K., 4,531,299, Cl. 33-366.000.

Howlett, James J.: *See*—
Zagranski, Raymond D.; and Howlett, James J., 4,531,361, Cl. 60-39.161.

Howorth Air Engineering Limited: *See*—
Howorth, Frederick H., 4,531,956, Cl. 55-279.000.

Howorth, Frederick H., to Howorth Air Engineering Limited. Sterile air trolley. 4,531,956, Cl. 55-279.000.

Hoxan Corporation: *See*—
Kuraoka, Yasuo, 4,531,958, Cl. 62-22.000.

Hsia, David: *See*—
Golant, Victor; Hsia, David; and Taylor, William, Jr., 4,532,155, Cl. 427-213.000.

Hsieh, Shao-Chung, to General Motors Corporation. Fusible electrical connector. 4,531,806, Cl. 339-147.00R.

Huber, Iren: *See*—
Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, 4,532,214, Cl. 435-228.000.

Huber, Paul W., to Dynabrade, Inc. Lip seal shroud. 4,531,329, Cl. 51-273.000.

Hubner, Heijo: *See*—
Jochum, Peter; Hubner, Heijo; and Gasser, Oswald, 4,532,268, Cl. 523-109.000.

Hude, Anton: *See*—
Doerges, Alexander; Schlauer, Johann; Kriebel, Manfred; and Hude, Anton, 4,532,116, Cl. 423-226.000.

Huegy, Charles W. Helical dome. 4,531,333, Cl. 52-81.000.

Hughes Aircraft Company: *See*—
Harrington, James A.; Pastor, Antonio C.; Standlee, Arlie G.; and Turk, Roger R., 4,532,000, Cl. 156-620.000.
Reeds, John W., 4,532,426, Cl. 250-442.100.
Zwirn, Robert, 4,532,548, Cl. 358-166.000.

Hughes, Donald W. K., to AMP Incorporated. Electrical terminal and terminal housing for making connections to insulated wires. 4,531,803, Cl. 339-97.00R.

Hughes Tool Company: *See*—
Jackson, Jay W.; and Golden, Ruben E., 4,531,749, Cl. 277-188.00A.

Humberstone, Victor C.; and Fisher, John H., to Comtech Research Unit Limited. Intense pre-illumination electrophotographic process. 4,532,197, Cl. 430-41.000.

Humphreys, Paula L.; and Okorley, Jonathan A., to Dow Chemical Company, The. Recovery of catalysts as W, Mo or Ru oxychlorides in liquid phase chlorination of pyiridine compounds. 4,532,111, Cl. 423-22.000.

Humphries, Michael J.; Liu, Chih-an; and Krutenat, Richard C., to Exxon Research and Engineering Co. MCrAlY cladding layers and method for making same. 4,532,191, Cl. 428-678.000.

Humpolik, Bohumil; and Kluna, Vlastimil, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Heat exchanger with a plurality of individual tubular parts and process for the manufacture thereof. 4,531,577, Cl. 165-150.000.

Hung, Jocelyn H.: *See*—
Werbel, Leslie M.; and Hung, Jocelyn H., 4,532,240, Cl. 514-252.000.

Hunsucker, William A. Roll restraint of anchored vessel. 4,531,471, Cl. 114-293.000.

Hunt, Al E.; Chandler, Richard A.; and Ward, Robert J., to Wiseda Ltd. Off-highway dump truck. 4,531,781, Cl. 298-22.00P.

Hurley, James R., to McGraw-Edison Company. Power theft detection circuit. 4,532,471, Cl. 324-110.000.

Hussmann, Dieter: *See*—
Gansert, Willi; Hussmann, Dieter; and Jakob, Gert, 4,531,796, Cl. 339-60.00M.

Huthmacher, Edward A. Universal wheeled assembly for grass trimmers. 4,531,350, Cl. 56-17.500.

Hydril Company: *See*—
Muchow, John D., 4,531,545, Cl. 137-625.390.

Ichikawa, Akira: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Ichikawa, Sumiaki: *See*—
Kai, Isao; Ichikawa, Sumiaki; and Mihara, Yozo, 4,532,271, Cl. 523-208.000.

Ichinose, Kazuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse width modulation type digital to analog converter. 4,532,496, Cl. 340-347.0DA.

Ideta, Yasufumi, to Nissan Motor Company, Limited. Check valve used with vacuum system for an automotive vehicle. 4,531,624, Cl. 192-0.094.

Ideta, Yasufumi, to Nissan Motor Co., Ltd. Control system for a vane type variable displacement pump. 4,531,898, Cl. 418-26.000.

Iemura, Takusuke; Goto, Takeshi; and Komaki, Hiroshi, to Okamura Corp. Rotatable stock container closet. 4,531,789, Cl. 312-268.000.

Ife, Robert J., to Smith Kline & French Laboratories Limited. 2-(2-Pyridylaminoalkylamino)-4-pyrimidones. 4,532,246, Cl. 514-275.000.

Igarashi, Chikara: *See*—
Hashimoto, Takashi; and Igarashi, Chikara, 4,532,165, Cl. 428-36.000.

Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Control apparatus for induction motor. 4,532,464, Cl. 318-807.000.

IHC Holland N.V.: *See*—
Brouwer, Cornelis A., 4,531,469, Cl. 114-29.000.

Iijima, Kenzaburo, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing a magnetic tape. 4,531,990, Cl. 156-60.000.

Iijima, Takahiro: *See*—
Maeda, Keikichi; and Iijima, Takahiro, 4,532,109, Cl. 422-240.000.

Iijima, Yoshitaka, to Nissan Motor Co., Ltd. Supporting structure for a steering apparatus of the rack and pinion type. 4,531,426, Cl. 74-498.000.

Iinuma, Daiwa: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.

Iiyama, Akihiro; Miyazaki, Hiroaki; Etoh, Yukihiro; and Tanaka, Toshiaki, to Nissan Motor Company, Limited. Fuel injection rate control system for an internal combustion engine. 4,531,491, Cl. 123-357.000.

Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,532,609, Cl. 365-154.000.

Ikeda, Takayuki; Kouhara, Kazuo; and Sasaki, Minoru, to Kabushiki Kaisha Alpha Giken. α-Cyanoacrylate instant adhesive composition containing BTDA or BTA. 4,532,293, Cl. 524-754.000.

Ikenoya, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Belt transmission having air cooling function. 4,531,928, Cl. 474-93.000.

Ikuma, Akira: *See—*
Mizuno, Yoshikazu; and Ikuma, Akira, 4,532,432, Cl. 307-10.00R.

Ilaug, Harold W.: *See—*
Sandt, David K.; Mitlyng, Arthur V., Jr.; Ilaug, Harold W.; and Quenemoen, Robert D., 4,531,538, Cl. 137-334.000.

Iliev, Maxim D.; Kervanbashiev, Stoyu S.; Karamanski, Stefan D.; and Makedonski, Frederik M., to CUV "Progress". Method and apparatus for producing electrical energy from a cyclic combustion process utilizing coupled pistons which reciprocate in unison. 4,532,431, Cl. 290-4.00R.

Illinois Tool Works Inc.: *See—*
Pliml, Frank V., Jr., 4,532,387, Cl. 200-11.00R.
Rayburn, Charles C., 4,531,268, Cl. 29-25.420.

Imai, Shigeo: *See—*
Suzuki, Migaku; Kobayashi, Toshio; Sasaki, Satoshi; and Imai, Shigeo, 4,532,173, Cl. 428-218.000.

Imaide, Takuya: *See—*
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.

Imbert, Michel: *See—*
Bouillez, Olivier; and Imbert, Michel, 4,532,392, Cl. 200-147.00R.

Imperial Chemical Industries Limited: *See—*
Briggs, Peter J.; and McAloon, Kevin, 4,532,176, Cl. 428-288.000.

Imperial Chemical Industries PLC: *See—*
Caldwell, David; Miller, David; and Padget, John C., 4,532,159, Cl. 427-388.400.
Johnson, David W., 4,532,231, Cl. 502-347.000.

Impro Technologies, Inc.: *See—*
Krueger, Roger J., 4,531,875, Cl. 414-22.000.

Inagaki, Kazuhiro: *See—*
Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, 4,532,254, Cl. 514-456.000.

Inagaki, Takafumi; and Ueda, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission control device for automobile. 4,531,432, Cl. 74-866.000.

Inagaki, Takehiro: *See—*
Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, 4,531,705, Cl. 249-134.000.

Inao, Hiroshi: *See—*
Yamamoto, Sakuci, Inao, Hiroshi; Nishida, Mitsuhiro; Matsushita, Matao; and Komoda, Hidemi, 4,532,446, Cl. 310-87.000.

Inco Alloys International, Inc.: *See—*
Pickens, Joseph R., 4,532,106, Cl. 420-528.000.

Industrial Electronic Rubber Company: *See—*
Murray, Myles N.; and Murphy, Joseph, 4,531,281, Cl. 29-570.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Valle, Franco; and Musso, Pietro, 4,531,850, Cl. 400-551.000.

Ingersoll Cutting Tool Company, The: *See—*
Smith, Darrel E., 4,531,863, Cl. 407-113.000.

Ingersoll-Rand Company: *See—*
Hartshorn, Kevin, 4,531,541, Cl. 137-514.000.
Markley, George L., 4,531,543, Cl. 137-515.700.

Innes, Margaret N. Method of treating migraine headaches. 4,532,244, Cl. 514-291.000.

Inoue, Jiro, to Murata Manufacturing Co., Ltd. Terminals and mounting for piezoelectric resonators. 4,532,451, Cl. 310-353.000.

Inoue, Shigeki: *See—*
Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, 4,532,561, Cl. 360-73.000.

Inspiron Corporation: *See—*
Miller, Kenneth G., 4,532,088, Cl. 261-142.000.

Institut Francais du Petrole: *See—*
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,532,370, Cl. 585-512.000.

International Business Machines Corporation: *See—*
Beach, Laurence R., Jr.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,531,689, Cl. 242-195.000.
Foster, Gregory J., 4,532,588, Cl. 364-200.000.
Jackson, Thomas N., 4,532,532, Cl. 357-15.000.
Jackson, Thomas N.; and Woodall, Jerry M., 4,532,533, Cl. 357-16.000.
Lee, Wen Y., 4,532,528, Cl. 346-135.100.
Pennebaker, William B., 4,532,503, Cl. 340-728.000.
Pennebaker, William B., Jr.; and Pennington, Keith S., 4,532,651, Cl. 382-54.000.
Robinson, Carl W., 4,531,700, Cl. 248-672.000.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,532,361, Cl. 568-382.000.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,532,364, Cl. 568-444.000.
Sprecker, Mark A., 4,532,050, Cl. 252-8.600.
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,532,357, Cl. 568-327.000.

International Flavors & Fragrancs Inc.: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,532,359, Cl. 568-346.000.

International Packaging Systems Inc.: *See—*
O'Malley, Michael P.; Henderson, David E.; Cable, Mark J.; and Hefferon, James E., 4,532,093, Cl. 264-40.100.

International Telephone & Telegraph Corporation: *See—*
Selvin, Gerald J., 4,531,790, Cl. 339-14.00R.

Inuta, Kazuo, to Dainippon Screen Manufacturing Co., Ltd. Rotary board treating apparatus. 4,531,474, Cl. 118-503.000.

Iomega Corporation: *See—*
Powell, Steven H., 4,532,562, Cl. 360-78.000.

Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Wound tire. 4,531,561, Cl. 152-510.000.

Ippolito, Ronald A.: *See—*
Federico, Anthony M.; Ippolito, Ronald A.; and Legg, Ernest L., 4,532,584, Cl. 364-140.000.

Irwin, Everett F. Rotating cylinder external combustion engine. 4,531,360, Cl. 60-39.630.

Ishida, Fumihiko: *See—*
Ohta, Norio; Ando, Keikichi; Hosoe, Yuzuru; Sugita, Yutaka; and Ishida, Fumihiko, 4,532,180, Cl. 428-336.000.

Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, to Victor Company of Japan, Limited. Impulse noise reduction by linear interpolation having a deemphasis characteristic. 4,532,475, Cl. 328-165.000.

Ishihama, Masao: *See—*
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,531,484, Cl. 123-192.00R.

Ishii, Fumio: *See—*
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.

Ishii, Yasuhisa: *See—*
Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, 4,531,647, Cl. 212-147.000.

Ishikawa, Nobuo; and Kitazume, Tomoya, to Daikin Kogyo Co., Ltd. Process for preparing a β-(fluoroalkyl or fluoroalkenyl)-β-hydroxyalkyne. 4,532,020, Cl. 204-158.0HA.

Ishino, Yoshihide, to Sharp Kabushiki Kaisha. LED level meter. 4,532,472, Cl. 324-122.000.

Iso, Yoshimi: *See—*
Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, 4,532,561, Cl. 360-73.000.

Isono, Tokio; and Tsunoda, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Suspension system for a front road wheel of a motorcycle. 4,531,755, Cl. 280-277.000.

Itagaki, Takafumi, to Tamatoshi Industries Ltd. Display apparatus. 4,531,331, Cl. 52-38.000.

Itek Corporation: *See—*
Aufiero, James M.; D'Agostino, William P., Jr.; and Moore, John P., 4,532,546, Cl. 358-111.000.

Ito, Katsuo; Yoshimura, Kazunori; Tsuji, Kazuhiro; and Kontani, Kazuo, to Murata Manufacturing Co., Ltd. Fine adjusting mechanism for preset type tuner. 4,532,485, Cl. 334-51.000.

Ito, Yoichiro, to United States of America, Health and Human Services. Multi-layer coil assembly coaxially mounted around the rotary axis for preparatory countercurrent chromatography. 4,532,039, Cl. 210-198.200.

Itoi, Kazuo: *See—*
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.

ITT Industries, Inc.: *See—*
Botz, Jakob; Mutschler, Erich; Prohaska, Hans; Schmid, Eckhardt; and Scholl, Wolfgang, 4,531,419, Cl. 74-388.0PS.

Ivankovich, Anthony D.: *See—*
Djordjevich, Ljubomir; Ivankovich, Anthony D.; and Gottschalk, William, 4,532,130, Cl. 424-101.000.

Ivanov, Sergei V.: *See—*
Voronin, Grigory I.; Suslov, Alexandr D.; Chizhikov, Jury V.; Ivanov, Sergei V.; and Voronin, Valentin G., 4,531,371, Cl. 62-5.000.

Ivanyi, Steven: *See—*
Daniels, Vernon A.; Park, Joonmin; and Ivanyi, Steven, 4,532,097, Cl. 264-258.000.

Iversen, Ralph T.: *See—*
Baur, Robert; Iversen, Ralph T.; and Stephenson, Roger C., 4,531,798, Cl. 339-75.00M.

Ivony, Jozsefne: *See—*
Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, 4,532,214, Cl. 435-228.000.

Ivy-Gene Co., Inc.: *See—*
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,531,938, Cl. 604-62.000.

Iwahashi, Haruo: *See—*
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, 4,531,827, Cl. 355-14.00R.

Iwamoto, Masatami; Nakamura, Shiro; Miyazaki, Masayuki; and Yoshioka, Sumio, to Mitsubishi Denki Kabushiki Kaisha. Rotor of superconductive generator. 4,532,445, Cl. 310-52.000.

Iwamoto, Yoshihiro: *See—*
Tanaka, Fuminari; and Iwamoto, Yoshihiro, 4,532,612, Cl. 365-227.000.

Iwatsu Electric Co., Ltd.: *See*—
Kato, Takefumi, 4,532,453, Cl. 313-391.000.

Izu, Masatsugu: *See*—
Nath, Prem; and Izu, Masatsugu, 4,532,372, Cl. 136-256.000.

Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, to Hitachi Construction Machinery Co., Ltd. Flushing valve system in closed circuit hydrostatic power transmission. 4,531,369, Cl. 60-456.000.

Izumi, Yoshitaka, to Kimura Bed Mfg. Company Limited. Vacuum suction type urinating aid. 4,531,939, Cl. 604-73.000.

J. M. Smucker Company, The: *See*—
Brain, Charles; and Johnston, Barry, 4,532,143, Cl. 426-577.000.

Jackowski, Ronald A., to Chicago Rawhide Manufacturing Co. Fluid seal with unitary wear sleeve element. 4,531,748, Cl. 277-153.000.

Jackson, Arthur; and Heyes, Graham, to Fine Organics Limited. Preparation of thiazine derivatives. 4,532,322, Cl. 544-54.000.

Jackson, Denise M.: *See*—
Hafner, Edmund W.; and Jackson, Denise M., 4,532,208, Cl. 435-94.000.

Jackson, Jay W.; and Golden, Ruben E., to Hughes Tool Company. Circular seal with integral backup rings. 4,531,749, Cl. 277-188.00A.

Jackson, Theodore A., to Ex-Cell-O Corporation. Weapon charger. 4,531,444, Cl. 89-1.400.

Jackson, Thomas N., to International Business Machines Corporation. Submicron conductor manufacturing. 4,532,532, Cl. 357-15.000.

Jackson, Thomas N.; and Woodall, Jerry M., to International Business Machines Corporation. Ballistic conduction semiconductor device. 4,532,533, Cl. 357-16.000.

Jacobozzi, Vivian M.; and Beltrand, Steven D., to Jacobozzi, Vivian M. Mounting means for remembrance items. 4,531,638, Cl. 206-486.000.

Jacobs, Franz. Fire flap arrangement. 4,531,544, Cl. 137-614.110.

Jacobson, James; and McCormick, Thomas E. Elongated football. 4,531,737, Cl. 273-65.00R.

Jacobsson, Kurt A. G., to Aktiebolaget IRO. Method for feeding yarns of different colors to a knitting machine and knitting machine for carrying out that method. 4,531,385, Cl. 66-132.00T.

Jager, Horst, to Bayer Aktiengesellschaft. Process for the preparation of triphendioxazine compounds. 4,532,323, Cl. 544-75.000.

Jakob, Gert: *See*—
Gansert, Willi; Hussmann, Dieter; and Jakob, Gert, 4,531,796, Cl. 339-60.00M.

James, Houston F. Quick-change plastic strip display board. 4,531,320, Cl. 40-621.000.

James, Robert E.: *See*—
Christie, Nick J.; Cox, Randall A.; James, Robert E.; and Stevenson, James C., 4,531,946, Cl. 8-192.000.

Jamieson, William B.: *See*—
Baker, Stephen R.; Lindstrom, Terry D.; Jamieson, William B.; and Ross, William J., 4,532,257, Cl. 514-470.000.

Jandrasi, Frank J.; and Ringle, Eric P., to General Signal Corporation. Control valve for flow of solids. 4,531,539, Cl. 137-375.000.

Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu; and Kato, Kenji, 4,531,466, Cl. 112-121.110.

Janusz, John M.; and LaHann, Thomas R., to Procter & Gamble Company, The. Compounds and compositions useful for producing analgesia. 4,532,139, Cl. 514-627.000.

Jaquiss, Donald B. G.; McCready, Russell J.; and Tyrell, John A., to General Electric Company. Stabilized polycarbonate-polyester compositions. 4,532,290, Cl. 524-417.000.

Jenkins, John M., III: *See*—
Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,532,311, Cl. 526-62.000.

Jessup, Thurman W.: *See*—
Shutt, Donald P.; and Jessup, Thurman W., 4,531,429, Cl. 74-792.000.

Jeumont-Schneider Corporation: *See*—
Paeye, Gerard F., 4,531,384, Cl. 62-477.000.

Jewer, Alan A., to News Log International, Inc. Method for optically encoding digital data on a substrate and the data record carrier formed thereby. 4,532,616, Cl. 369-44.000.

Jewett, Bryce D. Tooth rest for cutter grinder. 4,531,328, Cl. 51-238.00T.

JGC Corporation: *See*—
Maeda, Keikichi; and Iijima, Takahiro, 4,532,109, Cl. 422-240.000.

Jira, Reinhard: *See*—
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,532,295, Cl. 524-827.000.

Jochum, Peter; Hubner, Heijo; and Gasser, Oswald, to ESPE, Fabrik pharmazeutischer Praparate GmbH. Imidazole agent for retarding the polymerization of aziridine compounds. 4,532,268, Cl. 523-109.000.

John Deere Technologies International, Inc.: *See*—
Jones, Charles; Gigon, Richard M.; and Blum, Edward J., 4,531,900, Cl. 418-61.00A.

John Fluke Mfg. Co., Inc.: *See*—
Wiesmann, Thomas W., 4,532,470, Cl. 324-76.00R.

John Wyeth & Brother Limited: *See*—
Mughal, Ahmed S., 4,532,253, Cl. 514-374.000.

Johnson, Allan S., to Tapmatic Corporation. Tapping attachment adapted for numerical computer control. 4,531,865, Cl. 408-139.000.

Johnson, Cydney A.: *See*—
Bendell, Sidney L.; and Johnson, Cydney A., 4,532,550, Cl. 358-213.000.

Johnson, David W., to Imperial Chemical Industries PLC. Process for producing a catalyst. 4,532,231, Cl. 502-347.000.

Johnson, Floyd D.: *See*—
Warman, Bruce L.; Dailey, Carl W.; and Johnson, Floyd D., 4,531,453, Cl. 98-2.110.

Johnson, Gary M.; and Heuberger, Glen L., to Swift & Company. Method for inhibiting the developement of breast blisters on poultry. 4,531,518, Cl. 128-303.100.

Johnson, Lloyd N.: *See*—
Chadwick, James R.; and Johnson, Lloyd N., 4,531,408, Cl. 73-455.000.

Johnson, Robert O., to General Electric Company. Polyetherimide bearing compositions. 4,532,054, Cl. 252-12.400.

Johnson, Ronald E.; Rajnik, Lawrence S.; and Wu, Lung-ming, to Corning Glass Works. Collector membrane. 4,532,175, Cl. 428-220.000.

Johnson, Roy B., deceased (by Johnson, Wilma J., legal representative); and Ristvedt, Victor G., to Ristvedt-Johnson, Inc. Coin handling machine. 4,531,531, Cl. 133-3.00A.

Johnson, Wilma J., legal representative: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,531,531, Cl. 133-3.00A.

Johnston, Barry: *See*—
Brain, Charles; and Johnston, Barry, 4,532,143, Cl. 426-577.000.

Johnston, Orin B. Forming bead seal in biaxially oriented polymer film by heat bonding. 4,531,997, Cl. 156-498.000.

Johnston, Vaughn R., to Washington Rotating Control Heads. Drilling head method and apparatus. 4,531,591, Cl. 175-57.000.

Jolivet, Pierre: *See*—
Raynaud, Jacques; Darmois, Jean; Jolivet, Pierre; and Guillot, Jean, 4,531,693, Cl. 244-52.000.

Jonas, Rodger H.; Beel, Joseph W.; and Lynch, William R., to General Foods Corporation. Cacao product and process therefor. 4,532,147, Cl. 426-655.000.

Jones, Charles; Gigon, Richard M.; and Blum, Edward J., to John Deere Technologies International, Inc. Rotary engine cooling system. 4,531,900, Cl. 418-61.00A.

Jones, Hartl R.: *See*—
Kemp, David M., Jr.; and Jones, Hartl R., 4,531,456, Cl. 99-323.200.

Jones, Marvin R., to Cameron Iron Works, Inc. Rotating blowout preventers. 4,531,580, Cl. 166-84.000.

Jones, Michael J. Prismatic straightedge. 4,531,303, Cl. 33-483.000.

Jones, Paul W., to Textron Inc. Apparatus and method of welding nails to wires. 4,532,399, Cl. 219-117.100.

Jones, Thomas M.: *See*—
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Jordan, Lester W.; Loersch, Joseph F.; and Adinolfi, Robert G., to United Technologies Corporation. Weld spatter protective coating. 4,532,403, Cl. 219-121.0ED.

Joshi, Madhusudan: *See*—
Bedi, James J.; and Joshi, Madhusudan, 4,531,522, Cl. 128-335.000.

Joytronix, Inc.: *See*—
Pasternak, Eliezer, 4,531,292, Cl. 33-18.00R.

Jullien, Claude; and Lerude, Gerard, to La Telemecanique Electrique. Electrical connection device with ready-access protected terminals. 4,531,797, Cl. 339-61.00M.

Jung-Chi, Lai. Instant VELCRO assembly. 4,531,634, Cl. 206-391.000.

Juras, Martin, to Societe Bourguignonne de Mercanique. Thermal probe and apparatus incorporating the same. 4,531,844, Cl. 374-208.000.

Kabel- und Metallwerke Gutehoffnungshuette A.G.: *See*—
Ziemek, Gerhard; and Pahl, Ingo H., 4,531,991, Cl. 156-79.000.

Kabushiki Kaisha Alpha Giken: *See*—
Ikeda, Takayuki; Kouhara, Kazuo; and Sasaki, Minoru, 4,532,293, Cl. 524-754.000.

Kabushiki Kaisha Fujikoshi: *See*—
Okoh, Tomio; Matsumoto, Tomoaki; and Hirokawa, Noboru, 4,531,893, Cl. 417-220.000.

Kabushiki Kaisha Gosei Kagaku Kenkyusho: *See*—
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Kitagawa, Kazumi, 4,531,598, Cl. 177-128.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Ogata, Yohji; Aida, Isao; Murayama, Hirokazu; and Shibuya, Kenjiro, 4,532,409, Cl. 219-137.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Moriya, Yukio; Yoda, Tadashi; and Fukumoto, Hisashi, 4,531,366, Cl. 60-421.000.

Kabushiki Kaisha Kubota Seisakusho: *See*—
Hara, Minoru, 4,531,652, Cl. 220-83.000.

Kabushiki Kaisha Sato: *See*—
Kondo, Kouichi; and Oikawa, Tadahisa, 4,531,851, Cl. 400-583.300.

Kabushiki Kaisha Toshiba: *See*—
Akiyama, Tatsuo; Koshino, Yutaka; and Hiraki, Shunichi, 4,532,004, Cl. 156-653.000.
Takahashi, Tomohiko, 4,532,525, Cl. 346-76.0PH.

Kabushiki Kaisha Yakult Honsha: *See*—
Sako, Tomoyuki; Sawaki, Saeko; Sakurai, Toshizo; Mutai, Masahiko; and Kondo, Isamu, 4,532,211, Cl. 435-172.300.

Kade, Alexander, to General Motors Corporation. Electric power steering stall protection circuit. 4,532,567, Cl. 361-31.000.

Kadowaki, Toshio; and Sanji, Koichiro, to Sunstar Giken Kabushiki Kaisha. Two-part adhesive. 4,532,273, Cl. 523-402.000.

Kai, Isao; Ichikawa, Sumiaki; and Mihara, Yozo, to Asahi Yukizai Kogyo Kabushiki Kaisha. Bituminous paving material and a method for the preparation thereof. 4,532,271, Cl. 523-208.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Hebrant, Georges, 4,531,717, Cl. 266-166.000.

Kaiser, Carl: *See—*
Frazee, James S.; Kaiser, Carl; and Kruse, Lawrence I., 4,532,331, Cl. 548-342.000.

Kaji, Isamu. Conductive structure and method of manufacture thereof. 4,532,099, Cl. 264-510.000.

Kajiya, Seitaro: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Kajiyama, Shigeru; Takaku, Kazuo; Naruse, Akisuke; and Akasu, Akira, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Guide apparatus. 4,531,663, Cl. 228-29.000.

Kaken Pharmaceutical Co., Ltd.: *See—*
Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, 4,532,254, Cl. 514-456.000.

Kaku, Toshimitsu: *See—*
Tsunoda, Yoshito; Maeda, Takeshi; Nakamura, Shigeru; and Kaku, Toshimitsu, 4,532,522, Cl. 346-44.000.

Kals, Walter, to Niagara Blower Co. Apparatus for cooling fluids. 4,531,576, Cl. 165-108.000.

Kamichika, Masakazu: *See—*
Sasaki, Itsuo; Suzuki, Hiroaki; and Kamichika, Masakazu, 4,532,494, Cl. 340-347.0AD.

Kampel, Marian: *See—*
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,532,091, Cl. 264-29.500.

Kanada, Kenji: *See—*
Sugiura, Sabro; Fujita, Senji; Kanada, Kenji; Demukai, Noboru; and Okamoto, Tetuo, 4,531,971, Cl. 75-13.000.

Kanayama, Kaoru: *See—*
Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, 4,532,308, Cl. 525-482.000.

Kanbe, Rokuro; and Kimura, Kazuo, to NGK Spark Plug Co., Ltd. Metal-ceramics composite materials. 4,532,190, Cl. 428-627.000.

Kanda, Mikio: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Kane, James, to RCA Corporation. Photodetector with enhanced light absorption. 4,532,537, Cl. 357-30.000.

Kaneko, Yasutoshi; and Yamashita, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Sound board assembly for an upright piano. 4,531,442, Cl. 84-195.000.

Kaneko, Yutaka: *See—*
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.

Kang, Soon M.: *See—*
Lang, Stanley A., Jr.; Fields, Thomas L.; Wilkinson, Raymond G.; Kang, Soon M.; and Lin, Yang-I, 4,532,349, Cl. 564-194.000.

Kapralis, Imants P.; and Krukle, Harry, to Kapralis, Imants P.; Krukle, Harry; and Haefliger, William W., part interest to each. Protected trigger to controllably initiate crystallization. 4,532,110, Cl. 422-245.000.

Kar, Gitimoy; and Mensah, Thomas O., to Corning Glass Works. Method and apparatus for coating optical fibers. 4,531,959, Cl. 65-3.110.

Karamanski, Stefan D.: *See—*
Iliev, Maxim D.; Kervanbashiev, Stoyu S.; Karamanski, Stefan D.; and Makedonski, Frederik M., 4,532,431, Cl. 290-4.00R.

Karlovsky, Jerry, to National Mine Service Company. Mining machine with dust collector apparatus. 4,531,784, Cl. 299-64.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. Polyalkylpiperidine esters of aliphatic tetracarboxylic acids. 4,532,279, Cl. 524-102.000.

Kasei Naoetsu Light Metal Industries, Ltd.: *See—*
Mishima, Ryoji; and Miyamoto, Hitoshi, 4,531,977, Cl. 148-2.000.

Kash, Maurice D. Adhesively secured anchor rod. 4,531,861, Cl. 405-261.000.

Kato, Katsunori: *See—*
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.

Kato, Kazuhisa: *See—*
Yasui, Masaru; and Kato, Kazuhisa, 4,532,196, Cl. 430-31.000.

Kato, Kenji: *See—*
Hanyu, Susumu; and Kato, Kenji, 4,531,466, Cl. 112-121.110.

Kato, Takefumi, to Iwatsu Electric Co., Ltd. Storage target for storage tubes and method of fabrication. 4,532,453, Cl. 313-391.000.

Katsumata, Akira: *See—*
Oshitani, Akiyoshi; and Katsumata, Akira, 4,531,792, Cl. 339-17.0CF.

Katsuyama, Tsutomu, to Bell & Howell Japan Ltd. Device for storing exposed film for photographing and developing apparatus. 4,531,819, Cl. 354-92.000.

Katz, Lawrence H.: *See—*
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Kaufmann, Vendelin: *See—*
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Muller, Christina; Kober, Roland; and Renker, Wolfgang, 4,532,068, Cl. 252-188.280.

Kawada, Yasuyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Jun-ichi; and Ukigai, Toshiyuki, 4,532,053, Cl. 252-8.55D.

Kawade, Tateo: *See—*
Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, 4,531,762, Cl. 280-801.000.

Kawagoe, Nobukazu: *See—*
Yuasa, Yoshio; Kawagoe, Nobukazu; and Yasumoto, Hidetoshi, 4,531,830, Cl. 355-56.000.

Kawaguchi, Akio: *See—*
Hiraiwa, Kazuyoshi; and Kawaguchi, Akio, 4,531,424, Cl. 74-477.000.

Kawaguti, Hatsuo: *See—*
Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, 4,532,105, Cl. 420-451.000.

Kawai, Hideki; Nishihara, Hidetoshi; Nakaoka, Seishi; and Hamada, Koushi, to Matsushita Reika Co., Ltd. Sealed type motor compressor. 4,531,894, Cl. 417-312.000.

Kawakami, Hideaki: *See—*
Kitazima, Masaaki; and Kawakami, Hideaki, 4,532,506, Cl. 340-784.000.

Kawamata, Masanobu: *See—*
Enomoto, Hiroshi; Kawamata, Masanobu; Nomura, Akira; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,532,238, Cl. 514-245.000.

Kawamura, Koichiro: *See—*
Oota, Tadashi; and Kawamura, Koichiro, 4,532,558, Cl. 360-35.100.

Kawamura, Yoshihisa; and Tanaka, Toshiaki, to Nissan Motor Co., Ltd. Fuel injection pump for an internal combustion engine. 4,531,488, Cl. 123-300.000.

Kawamura, Yoshio, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Fluidized bed combustor. 4,531,907, Cl. 431-170.000.

Kawano, Hikaru: *See—*
Sato, Koji; and Kawano, Hikaru, 4,531,344, Cl. 53-447.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo; Tamba, Shinichi; and Miyake, Hitomi, 4,531,487, Cl. 123-198.0DC.

Kawasaki Steel Corporation: *See—*
Sato, Kuniaki; Muto, Shinichiro; Yanagishima, Fumiya; and Shimoyama, Yûji, 4,531,904, Cl. 431-10.000.

Kawazura, Hiroshi: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., to Ivy-Gene Co., Inc. Medicament implant applicator. 4,531,938, Cl. 604-62.000.

Keigher, William T. Firefighter's ladder. 4,531,613, Cl. 182-206.000.

Keil, Joseph W., to Dow Corning Corporation. Skin care formulations comprising a water-in-mineral oil emulsion and siloxane compositions therefor. 4,532,132, Cl. 514-772.000.

Keinborg, Maurice; Varin, Philippe; Bertaud, Yves; and Leroy, Michel, to Aluminium Pechiney. Floating cathode elements based on electrically conductive refractory material, for the production of aluminum by electrolysis. 4,532,017, Cl. 204-67.000.

Kel Corporation: *See—*
Oshitani, Akiyoshi; and Katsumata, Akira, 4,531,792, Cl. 339-17.0CF.

Keller, Hartmut: *See—*
Forster, Siegfried; Schindler, Stefan R.; and Keller, Hartmut, 4,531,908, Cl. 431-215.000.

Kelly Crisp: *See—*
Laube, Kim E., 4,531,291, Cl. 30-216.000.

Kelly, Edward F. Method of repairing automobile bodies. 4,531,275, Cl. 29-402.120.

Kelly, Lawrence F.: *See—*
DeGraw, Joseph I.; Kelly, Lawrence F.; and Sirotnak, Francis M., 4,532,241, Cl. 514-258.000.

Kemp, David M., Jr.; and Jones, Hartl R., to FMC Corporation. Liquid distribution trough. 4,531,456, Cl. 99-323.200.

Kendall Company, The: *See—*
England, William T.; and Lau, Wing Y. T., 4,531,386, Cl. 66-202.000.

Kennecott Corporation: *See—*
Rushforth, Calvin, 4,531,568, Cl. 164-439.000.

Keriakos, Magdy H.; and Rosenbaum, Stanley D., to Northern Telecom Limited. Line feed circuit including negative impedance circuit. 4,532,384, Cl. 179-170.00G.

Kern, Kenneth C., to Exxon Research and Engineering Co. Manifold to uniformly distribute a solid-liquid slurry. 4,531,862, Cl. 406-155.000.

Kernforschungsalage Julich GmbH: *See—*
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,532,091, Cl. 264-29.500.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Aivasidis, Alexander; and Wandrey, Christian, 4,532,042, Cl. 210-603.000.
Forster, Siegfried; Schindler, Stefan R.; and Keller, Hartmut, 4,531,908, Cl. 431-215.000.
Furst, Leander; and Divisek, Jiri, 4,532,023, Cl. 204-402.000.

Kervanbashiev, Stoyu S.: *See—*
Iliev, Maxim D.; Kervanbashiev, Stoyu S.; Karamanski, Stefan D.; and Makedonski, Frederik M., 4,532,431, Cl. 290-4.00R.
Khonsari, Ali M.; and Suciu, George D., to Lummus Company, The. Production of high purity phenol by distillation with steam and a solvent. 4,532,012, Cl. 203-53.000.
Khoobiar, Sargis, to Halcon SD Group, Inc., The. Conversion of alkanes to unsaturated aldehydes. 4,532,365, Cl. 568-479.000.
Kienzle Apparatus GmbH: *See—*
Madge, Werner; Vogelhuber, Peter; Stellmach, Dieter; and Hauger, Josef, 4,531,852, Cl. 400-692.000.
Kiernan, James G.; Liddell, Robert J.; and Henke, Ronald T., to General Electric Co. Flow divider. 4,531,535, Cl. 137-99.000.
Killen, Dale H., to Deere & Company. Reservoir for a multi-pump hydraulic system. 4,531,368, Cl. 60-453.000.
Kim, Yung J., to Baker Oil Tools, Inc. Concentric insulating conduit. 4,531,552, Cl. 138-149.000.
Kimberly-Clark Corporation: *See—*
Allison, John P., 4,531,945, Cl. 604-378.000.
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, to Nissan Motor Co., Ltd. Vibration responsive mounting arrangement for automotive engine or the like. 4,531,484, Cl. 123-192.00R.
Kimura, Akiyoshi: *See—*
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Kimura Bed Mfg. Company Limited: *See—*
Izumi, Yoshitaka, 4,531,939, Cl. 604-73.000.
Kimura Chemical Plants Co., Ltd.: *See—*
Tajiri, Tadaaki; and Nishizawa, Hitoshi, 4,532,118, Cl. 423-226.000.
Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, to Hitachi, Ltd. Playback speed control system. 4,532,561, Cl. 360-73.000.
Kimura, Kazuhiko: *See—*
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.
Kimura, Kazuo: *See—*
Kanbe, Rokuro; and Kimura, Kazuo, 4,532,190, Cl. 428-627.000.
Kimura, Kiyoshi: *See—*
Miwa, Tadashi; Kimura, Kiyoshi; Okamoto, Yukio; and Tarumi, Noriyoshi, 4,531,825, Cl. 355-3.0TR.
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, 4,531,827, Cl. 355-14.00R.
Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, to C. I. Kasei Co. Ltd.; and Kuraray Isoprene Chemical Co. Ltd. Compression-resistant water-swellable rubber composition and watertight sealing material comprising the same. 4,532,298, Cl. 525-96.000.
Kindt, Warren W.: *See—*
Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., 4,532,126, Cl. 424-48.000.
Kinney, William M.: *See—*
Bullock, Wilbur W., 4,531,771, Cl. 294-104.000.
Kipp, Glenn: *See—*
Loewenstern, Kenneth; Clementi, Daniel M.; and Kipp, Glenn, 4,531,416, Cl. 73-735.000.
Kirchner, Edward C.: *See—*
Matthew, John B.; and Kirchner, Edward C., 4,531,681, Cl. 241-146.000.
Kirtley, Robert H., Jr. Partially separable attachment device for sheet metal screed and stake assemblies. 4,531,858, Cl. 404-48.000.
Kiser, Darrel R.: *See—*
Kratz, Richard L.; Kiser, Darrel R.; and Smith, R. Scott, 4,531,463, Cl. 110-212.000.
Kishi, Norimasa: *See—*
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,532,648, Cl. 381-41.000.
Kishi, Noriyuki; Koumura, Takashi; and Hosokawa, Takehiko, to Honda Giken Kogyo Kabushiki Kaisha. Idling speed feedback control method having fail-safe function for abnormalities in functioning of crank angle position-detecting system of an internal combustion engine. 4,531,490, Cl. 123-339.000.
Kiss, Janosne : *See—*
Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, 4,532,214, Cl. 435-228.000.
Kitagawa, Kazumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Movable article discharger in an automatic weighing apparatus. 4,531,598, Cl. 177-128.000.
Kitaguchi, Hiroshi; Kudo, Masashi; and Fujii, Masaaki, to Hitachi, Ltd. Apparatus for measuring concentration of radioactivity. 4,532,103, Cl. 376-245.000.
Kitajima, Tadayuki; and Kimura, Akiyoshi, to Canon Kabushiki Kaisha. Variable magnification image formation apparatus. 4,531,831, Cl. 355-57.000.
Kitamura, Norio: *See—*
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.
Kitao, Zenichi: *See—*
Koizumi, Haruyuki; Kitao, Zenichi; and Sato, Hideki, 4,532,393, Cl. 200-159.00R.
Kitazima, Masaaki; and Kawakami, Hideaki, to Hitachi, Ltd. Matrix display and driving method therefor. 4,532,506, Cl. 340-784.000.
Kitazume, Tomoya: *See—*
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,532,020, Cl. 204-158.0HA.
Kitchener, John A.: *See—*
Cash, John; and Kitchener, John A., 4,531,955, Cl. 55-185.000.
Kitchens, Roy A.; and DeGroff, Charles K., to National Industries, Inc. Portable splicing tool. 4,531,283, Cl. 29-753.000.
KLA Instruments Corporation: *See—*
Wihl, Tim S.; and Wihl, Mark J., 4,532,650, Cl. 382-8.000.
Klamm, George F. Fish filleting kit. 4,531,260, Cl. 17-70.000.
Klefisch, Rudolf. Conveyor belt. 4,531,631, Cl. 198-853.000.
Klein, Ivan D.: *See—*
Winters, Donald C.; and Klein, Ivan D., 4,532,006, Cl. 162-3.000.
Klein, Robert R.: *See—*
Wagensommer, Joseph; Klein, Robert R.; and Lundberg, Robert D., 4,532,302, Cl. 525-343.000.
Klein, Wolfgang, to Akzo Nv. Arrangement for filtering a liquid. 4,531,954, Cl. 55-159.000.
Kleine, Werner, to Gebruder Helier Dinklage GmbH Werkzeugfabrik. Tool for boring an enlarged portion within the interior of a hole and a tiltable tool for completing that tool. 4,531,596, Cl. 175-384.000.
Klepesch, Philip H. Continuous blade multi-stage pump. 4,531,887, Cl. 415-90.000.
Kleschick, William A., to Dow Chemical Company, The. Process for making optically active esters of phenoxyphenoxypropionic acids or pyridyloxyphenoxypropionic acids. 4,532,328, Cl. 546-302.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Weber, Thomas; and Haselbauer, Franz, 4,531,357, Cl. 60-39.070.
Klopfenstein, Wayne A.: *See—*
Hart, Cullen P.; and Klopfenstein, Wayne A., 4,531,787, Cl. 305-12.000.
Kluna, Vlastimil: *See—*
Humpolik, Bohumil; and Kluna, Vlastimil, 4,531,577, Cl. 165-150.000.
Klutchko, Sylvestor: *See—*
Hoefle, Milton L.; and Klutchko, Sylvestor, 4,532,342, Cl. 560-38.000.
Knable, Thomas; Sollner, Lydia; Wethey, Richard; and Otte, Ilse. Writing fluid. 4,532,276, Cl. 524-18.000.
Knapp, Gordon G., to Ethyl Corporation. Alcohol and gasohol fuels having corrosion inhibiting properties. 4,531,948, Cl. 44-53.000.
Knapp, Heinrich, to Robert Bosch GmbH. Injection valve. 4,531,678, Cl. 239-533.300.
Kniazzeh, Alfredo G.; Mailloux, Dennis R.; and Norvaisa, Kestutis, to Polaroid Corporation. Vented frame for laminar batteries and methods of making the same. 4,532,193, Cl. 429-82.000.
Knogo Corporation: *See—*
Minasy, Arthur J., 4,531,264, Cl. 24-155.0BR.
Knoll, William C.; and Bay, David L., to GTE Products Corporation. Output circuit for an electronic ballast system. 4,532,456, Cl. 315-223.000.
Kobayashi, Hiroshi, to Nissan Motor Company, Limited. Fuel gauge for an automotive vehicle. 4,531,407, Cl. 73-304.00C.
Kobayashi, Shinichi: *See—*
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Saito, Mikio; and Futatsuya, Fumio, 4,531,964, Cl. 71-92.000.
Kobayashi, Sumio: *See—*
Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, 4,532,464, Cl. 318-807.000.
Kobayashi, Toshiaki; and Yoshimura, Masafumi, to New Japan Chemical Co., Ltd. Crystalline polyolefin-type resin compositions. 4,532,280, Cl. 524-108.000.
Kobayashi, Toshio: *See—*
Suzuki, Migaku; Kobayashi, Toshio; Sasaki, Satoshi; and Imai, Shigeo, 4,532,173, Cl. 428-218.000.
Kobayasi, Yoshizi: *See—*
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Kober, Roland: *See—*
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Kobiske, Michael; Voigt, William; and Sharma, Kris, to Maremont Corporation. Interchangeable strut body. 4,531,618, Cl. 188-321.110.
Kobs, Rolf U. D.: *See—*
Orlowski, Reiner U.; Kobs, Rolf U. D.; and Liehr, Manfred R., 4,531,415, Cl. 73-718.000.
Koch, Friedrich-Otto; and Wahl, Hans-Jurgen, to Hoesch Werke Aktiengesellschaft. Test system for defect determination in welding seams. 4,531,409, Cl. 73-588.000.
Kodama, Hisashi: *See—*
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Koehler, Gernot: *See—*
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,532,188, Cl. 428-500.000.
Koike, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Mosfet logical circuit with increased noise margin. 4,532,439, Cl. 307-450.000.
Koizumi, Haruyuki; Kitao, Zenichi; and Sato, Hideki, to Omron Tateisi Electronics. Co. Push button switch. 4,532,393, Cl. 200-159.00R.
Kojima, Gendai: *See—*
Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, 4,531,555, Cl. 139-429.000.
Kojima, Masanori: *See—*
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Kojima, Shigeru: *See*—
Ueda, Akiyoshi; Nagasaki, Humiko; Takakura, Yutaka; and Kojima, Shigeru, 4,532,363, Cl. 568-424.000.
Kollmorgen Technologies Corporation: *See*—
Crook, James C., 4,532,461, Cl. 318-254.000.
Komaki, Hiroshi: *See*—
Iemura, Takusuke; Goto, Takeshi; and Komaki, Hiroshi, 4,531,789, Cl. 312-268.000.
Komoda, Hidemi: *See*—
Yamamoto, Sakuei; Inao, Hiroshi; Nishida, Mitsuhiro; Matsushita, Matao; and Komoda, Hidemi, 4,532,446, Cl. 310-87.000.
Kompis, Ivan, to Hoffmann-La Roche Inc. Pharmaceutical compositions. 4,532,245, Cl. 514-275.000.
Kondo, Isamu: *See*—
Sako, Tomoyuki; Sawaki, Saeko; Sakurai, Toshizo; Mutai, Masahiko; and Kondo, Isamu, 4,532,211, Cl. 435-172.300.
Kondo, Kouichi; and Oikawa, Tadahisa, to Kabushiki Kaisha Sato. Mark detector for printers. 4,531,851, Cl. 400-583.300.
Konishiroku Photo Industry Co., Ltd.: *See*—
Miwa, Tadashi; Kimura, Kiyoshi; Okamoto, Yukio; and Tarumi, Noriyoshi, 4,531,825, Cl. 355-3.0TR.
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, 4,531,827, Cl. 355-14.00R.
Konno, Kunio; Tanaka, Masashi; and Ohki, Hiroshi, to Nippon Kogaku K. K. Objective lens. 4,531,815, Cl. 350-475.000.
Konno, Setsuzou: *See*—
Nagayasu, Kuniaki; Konno, Setsuzou; and Yoshida, Toshio, 4,531,305, Cl. 34-31.000.
Konno, Toshio: *See*—
Matsuda, Norio; Konno, Toshio; Yamamoto, Kaneo; Tominaga, Shinya; Kubo, Susumu; Mori, Yasuyuki; Akiyama, Naoki; and Murakami, Masaki, 4,532,620, Cl. 369-136.000.
Kontani, Kazuo: *See*—
Ito, Katsuo; Yoshimura, Kazunori; Tsuji, Kazuhiro; and Kontani, Kazuo, 4,532,485, Cl. 334-51.000.
Kos, Bernd, to Vereinigte Edelstahlwerke AG (VEW). Work-hardenable austenitic manganese steel and method for the production thereof. 4,531,974, Cl. 75-123.00N.
Kosarzecki, Constantine, to Modular Controls Corporation. Flow divider-combiner valve. 4,531,536, Cl. 137-111.000.
Koshino, Yutaka: *See*—
Akiyama, Tatsuo; Koshino, Yutaka; and Hiraki, Shunichi, 4,532,004, Cl. 156-653.000.
Kosrow, Robert L., to Union Special Corporation. Automatic transfer apparatus. 4,531,721, Cl. 270-45.000.
Kossovskaya, Irina L.: *See*—
Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., 4,531,934, Cl. 604-22.000.
Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., to Gorkovsky Gosudarstvenny Meditsinsky Institute Imini S.M. Kirova. Apparatus for the fragmentation and aspiration of ocular tissue. 4,531,934, Cl. 604-22.000.
Kouhara, Kazuo: *See*—
Ikeda, Takayuki; Kouhara, Kazuo; and Sasaki, Minoru, 4,532,293, Cl. 524-754.000.
Koumura, Takashi: *See*—
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Kouzuki, Rikuzou: *See*—
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Kovacic, Guido: *See*—
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Kovacs, Michael J. Bowling delivery reminder. 4,531,735, Cl. 273-54.00B.
Koyama, Kenji: *See*—
Takasaki, Kanetake; Takagi, Mikio; and Koyama, Kenji, 4,532,022, Cl. 204-192.00D.
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, to Hitachi, Ltd. Entrained flow coal gasification process. 4,531,949, Cl. 48-202.000.
Korponti Valto es Hitelbank RT.: *See*—
Boronyak, Imre; and Gyokhegyi, Laszlo , 4,532,087, Cl. 261-114.0JF.
Kramer, Axel: *See*—
Teubner, Herbert; Kramer, Axel; Weuffen, Wolfgang; Schrotter, Eberhard; and Grubel, Gerhard, 4,532,367, Cl. 568-745.000.
Kratz, Richard L.; Kiser, Darrel R.; and Smith, R. Scott, to American Energy Corporation. Baffle for controlled air incinerators. 4,531,463, Cl. 110-212.000.
Kraus, Arthur A., Sr. Three-phase leakage protection by electronic control. 4,532,568, Cl. 361-42.000.
Kraus, Robert A. Linear displacement transducer device. 4,531,414, Cl. 73-705.000.
Kravchuk, Jury K.: *See*—
Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., 4,531,934, Cl. 604-22.000.
Kremer, Ross A.: *See*—
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Kridl, Thomas A.: *See*—
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Kriebel, Manfred: *See*—
Doerges, Alexander; Schlauer, Johann; Kriebel, Manfred; and Hude, Anton, 4,532,116, Cl. 423-226.000.
Krob, Erwin: *See*—
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Kroll, Arthur S.; and Shuster, Frank A., to Eastman Kodak Company. Electrographic apparatus, method and system employing image development adjustment. 4,531,832, Cl. 355-3.0DD.
Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Gau, George, 4,531,995, Cl. 156-456.000.
Krueger, Roger J., to Impro Technologies, Inc. Automated pipe equipment system. 4,531,875, Cl. 414-22.000.
Kruger GmbH & Co. KG: *See*—
Wilhelm, Wolfgang, 4,532,595, Cl. 364-463.000.
Krukle, Harry: *See*—
Kapralis, Imants P.; and Krukle, Harry, 4,532,110, Cl. 422-245.000.
Krupp-Koppers GmbH: *See*—
Durslen, Heinz; Faust, Winifried; and Schlosser, Rainer, 4,532,010, Cl. 202-248.000.
Kruse, Lawrence I.: *See*—
Frazee, James S.; Kaiser, Carl; and Kruse, Lawrence I., 4,532,331, Cl. 548-342.000.
Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Expansible polymer molding process and the resultant product. 4,532,263, Cl. 521-133.000.
Krutchen, Charles M.: *See*—
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Krutenat, Richard C.: *See*—
Humphries, Michael J.; Liu, Chih-an; and Krutenat, Richard C., 4,532,191, Cl. 428-678.000.
Ku, Audrey Y.: *See*—
Chupp, John P.; Ku, Audrey Y.; Neumann, Thomas E.; and Nickson, Thomas E., 4,532,353, Cl. 564-442.000.
Kubo, Shigeki: *See*—
Nakahira, Hiroshi; and Kubo, Shigeki, 4,532,112, Cl. 423-87.000.
Kubo, Susumu: *See*—
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Kubota, Takuo: *See*—
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Kudo, Masashi: *See*—
Kitaguchi, Hiroshi; Kudo, Masashi; and Fujii, Masaaki, 4,532,103, Cl. 376-245.000.
Kuecker, Pamela M., to Maytag Company, The. Fabric dryer control with cycle interrupt. 4,531,307, Cl. 34-48.000.
Kuhn, John B., to Deere & Company. Tractor hitch arrangement. 4,531,757, Cl. 280-461.00A.
Kuhnlein, Hans; and Stark, Reinhard, to Siemens Aktiengesellschaft. Calorimeter. 4,531,843, Cl. 374-40.000.
Kukes, Simon G.; and Shioyama, Tod K., to Phillips Petroleum Company. Olefin oxidation catalyst. 4,532,362, Cl. 568-401.000.
Kull, Hermann: *See*—
Bodig, Bernd; Kull, Hermann; and Schleupen, Richard, 4,532,437, Cl. 307-358.000.
Kumakura, Mikio: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.
Kunii, Takeshi: *See*—
Nakayama, Yasunobu; Kunii, Takeshi; and Sato, Yasuji, 4,532,378, Cl. 179-2.0DP.
Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, to Shinokoku Steel Corporation; Nitto Boseki Co., Ltd.; and Paramount Glass Mfg., Co., Ltd. Casting alloy resistant to corrosion and wear at elevated temperatures. 4,532,105, Cl. 420-451.000.
Kuper, Douglas D.: *See*—
Menezes, William A.; and Kuper, Douglas D., 4,532,502, Cl. 340-717.000.
Kupersmit, Julius B. Combination clip and seal construction for shipping containers. 4,531,670, Cl. 229-45.00R.
Kuraoka, Yasuo, to Hoxan Corporation. Helium gas liquefying apparatus. 4,531,958, Cl. 62-22.000.
Kuraray Co., Ltd.: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.
Kuraray Isoprene Chemical Co. Ltd.: *See*—
Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, 4,532,298, Cl. 525-96.000.
Kurata, Masami; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Picture information reading apparatus. 4,532,551, Cl. 358-293.000.
Kureha Chemical Industry Co., Ltd.: *See*—
Hori, Saburo, 4,532,224, Cl. 501-105.000.
Kuromatsu, Akio, to Nicco Machine Tool Company Ltd. Grinding wheel and method for electrolytic and mechanical grinding. 4,532,019, Cl. 204-129.460.
Kurth, Richard R.: *See*—
Price, Robert; and Kurth, Richard R., 4,532,639, Cl. 375-96.000.

Kurumi, Masateru: *See*—
Fujii, Setsuro; Okutome, Toshiyuki; Nakayama, Toyoo; Yaegashi, Takashi; and Kurumi, Masateru, 4,532,255, Cl. 514-466.000.
Kusakabe, Haruhiko: *See*—
Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, 4,531,555, Cl. 139-429.000.
Kusakabe, Tomio: *See*—
Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,531,284, Cl. 29-784.000.
Kuznetsov, Stephen B.; and Laithwaite, Eric R., to National Research Development Corporation. Variable-speed electrical machines. 4,532,458, Cl. 318-111.000.
Kyowa Kikai Kogyo Kabushiki Kaisha: *See*—
Watanabe, Yoshinori, 4,531,250, Cl. 15-104.120.
La Telemecanique Electrique: *See*—
Jullien, Claude; and Lerude, Gerard, 4,531,797, Cl. 339-61.00M.
LaBerge, Edward F. C.; and Calzetta, Robert K., to Allied Corporation. Cyclic redundancy check monitor for microwave landing system beam steering unit. 4,532,517, Cl. 343-372.000.
Labib, Mohamed E.; Wang, Chin-Chun; and Poll, Robert F., to RCA Corporation. Capacitance electronic disc molding composition. 4,532,074, Cl. 252-511.000.
LaBouff, Gary A., to Deere & Company. Method of assembling an improved heat insulated piston. 4,531,269, Cl. 29-156.50R.
Lachman, Irwin M.: *See*—
Golino, Carlo M.; Lachman, Irwin M.; and Nordlie, Lawrence A., 4,532,228, Cl. 502-261.000.
Ladish Co.: *See*—
Zimmerly, Robert D., 4,531,532, Cl. 137-15.000.
Lagger, Helmut; Schmid, Elisabeth; and Haider, Erich, to Siemens Aktiengesellschaft. Method and apparatus for the exponentiation of large binary numbers in a residue class modulo N, particularly for encoding and decoding digitally-represented messages. 4,532,638, Cl. 375-17.000.
LaHann, Thomas R.: *See*—
Janusz, John M.; and LaHann, Thomas R., 4,532,139, Cl. 514-627.000.
L'Air Liquide S.A. pour l'Etude et Exploitation des Procedes Georges Claude: *See*—
Noren, Per-Olle, 4,532,007, Cl. 162-161.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Desprez, Marc, 4,531,960, Cl. 65-134.000.
Madsac, Michel; and Hiron, Thierry, 4,531,984, Cl. 148-16.600.
Laithwaite, Eric R.: *See*—
Kuznetsov, Stephen B.; and Laithwaite, Eric R., 4,532,458, Cl. 318-111.000.
Lakhani, Rajni R.: *See*—
Steele, Robert E.; Tailor, Dilip K.; and Lakhani, Rajni R., 4,532,168, Cl. 428-99.000.
Lamalle, Maurice: *See*—
Bachelard, Roland; and Lamalle, Maurice, 4,532,121, Cl. 423-600.000.
Lamer, Gerald P., to Marine Travelift, Inc. Hydraulic steering synchronization system. 4,531,604, Cl. 180-152.000.
Lancaster, Gerald M.; and Hoenig, Stephen M., to Dow Chemical Company, The. Blown nylon film and process for the preparation thereof. 4,532,100, Cl. 264-564.000.
Landa, Benzion, to Savin Corporation. Heater for electrophotographic copiers. 4,531,824, Cl. 355-3.0FU.
Landis, Phillip S.: *See*—
Horodysky, Andrew G.; and Landis, Phillip S., 4,532,057, Cl. 252-49.800.
Lang, Stanley A., Jr.; Fields, Thomas L.; Wilkinson, Raymond G.; Kang, Soon M.; and Lin, Yang-I, to American Cyanamid Company. 2-Amino-4'(phenylsulfonyl) acetanilides. 4,532,349, Cl. 564-194.000.
Langeluddeke, Peter: *See*—
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.
Langhorst, Martin A.: *See*—
Prud'homme, Robert K.; Stanley, Frederick W., Jr.; and Langhorst, Martin A., 4,532,043, Cl. 210-635.000.
Langlais, Jacques F.; and Brisset, Gilbert C., to Testut-Aequitas. Electrical measurement circuit including a low-pass filter, in particular for weighing. 4,531,600, Cl. 177-185.000.
Large, Donald M.: *See*—
Beltz, Richard K.; and Large, Donald M., 4,531,277, Cl. 29-466.000.
Larigaldie, Serge: *See*—
Boulay, Jean-Louis; Larigaldie, Serge; and Reibaud, Jean-Louis, 4,531,691, Cl. 244-1.00A.
Larkins, David N., to Ampex Corporation. Synchronous programmable parallel-to-serial data converter and a programmable longitudinal time code generator utilizing the converter. 4,532,557, Cl. 360-33.100.
Larronde, Michael L.; and Hoos, Robert G., to NL Industries, Inc. Valve latch device for drilling fluid telemetry systems. 4,531,579, Cl. 166-66.000.
Larson, Bert R.; Wartenbergh, Robert P.; Warszawski, Janusz; Meier, Markus; Sutton, David A.; Ho, Bin-Lun; and Bromshvatch, Efim, to Dysan Corporation. Removable disk cartridge. 4,532,564, Cl. 360-97.000.
Larsson, Per-Olof; Mosbach, Klaus; and Borchert, Axel, to Pernovo AB. Lectin-containing separation agent. 4,532,232, Cl. 502-403.000.
Lau, Wing Y. T.: *See*—
England, William T.; and Lau, Wing Y. T., 4,531,386, Cl. 66-202.000.
Laube, Kim E., to Kelly Crisp. Animal grooming clipper. 4,531,291, Cl. 30-216.000.
Lauterbach-Dammler, Inge: *See*—
Taube, Thomas; and Lauterbach-Dammler, Inge, 4,532,634, Cl. 373-93.000.
Lavi, Sara, to Yeda Research and Development Company Ltd. Assays for the determination of carcinogenicity. 4,532,220, Cl. 436-501.000.
Law, Denny B., to Unique Functional Products. Gymnastic equipment. 4,531,731, Cl. 272-145.000.
Laws, Dee G.; Scavo, Frank A.; Laws, E. Wayne; and Scavo, Frank R., to Scavo, Frank A., a part interest. Safety cab for underground mining equipment. 4,531,776, Cl. 296-190.000.
Laws, E. Wayne: *See*—
Laws, Dee G.; Scavo, Frank A.; Laws, E. Wayne; and Scavo, Frank R., 4,531,776, Cl. 296-190.000.
Layton, James E., to Phillips Petroleum Company. Waveform generator. 4,532,434, Cl. 307-261.000.
Lazcano-Navarro, Arturo; and Villasenor-Mejia, Antonio. Iron ores treatment apparatus. 4,531,718, Cl. 266-186.000.
Leahy, John P.: *See*—
Stoughton, Alan M.; Hansen, Charles C., Sr.; Leahy, John P.; and Millar, Robert F., 4,531,826, Cl. 355-14.0CU.
Lear Siegler, Inc.: *See*—
Gabriele, Leonard A., 4,531,868, Cl. 409-269.000.
Lechner, Manfred; and Stich, Kurt, to Messerschmitt-Bolkow-Blohm GmbH. Method for manufacturing a rotationally symmetrical construction part. 4,531,271, Cl. 29-157.00C.
Lee, Gim F., Jr.; and Williams, Robert A., to General Electric Company. Mineral filled polyphenylene ether resin compositions containing polytetrafluoroethylene resin. 4,532,281, Cl. 524-141.000.
Lee, Wen Y., to International Business Machines Corporation. Archival optical storage medium. 4,532,528, Cl. 346-135.100.
Leger, Gerard: *See*—
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,532,370, Cl. 585-512.000.
Legg, Ernest L.: *See*—
Federico, Anthony M.; Ippolito, Ronald A.; and Legg, Ernest L., 4,532,584, Cl. 364-140.000.
Leidy, Donald E. Three for all rope ring toss device. 4,531,745, Cl. 273-336.000.
Leiner, Howard H.: *See*—
Gitlitz, Melvin H.; Russell, David B.; and Leiner, Howard H., 4,532,269, Cl. 523-122.000.
Leister, Peter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method and device for measuring the level of a fluid inside of a container. 4,531,405, Cl. 73-290.00V.
Leland, John: *See*—
Boultinghouse, Harold D.; Boeke, Paul J.; Benefield, Robert E., Jr.; and Leland, John, 4,532,015, Cl. 204-38.400.
L'Electricfil Industrie: *See*—
Trigon, Jean, 4,531,807, Cl. 339-223.00S.
Lemelson, Jerome H. Automatic vehicle identification system and method. 4,532,511, Cl. 340-933.000.
Lemoine, Austin J.: *See*—
Coombes, Graham E.; and Lemoine, Austin J., 4,531,533, Cl. 137-46.000.
Lemon, Douglas K.: *See*—
Collins, H. Dale; Busse, Lawrence J.; and Lemon, Douglas K., 4,531,411, Cl. 73-603.000.
Lenderking, Bruce N.; and Couch, Robert D., to Westinghouse Electric Corp. Automatic temperature calibration method and apparatus. 4,532,601, Cl. 364-571.000.
Lenz, Werner; Sander, Hans; and Moller, Dieter, to BASF Aktiengesellschaft. Production of coatings. 4,532,300, Cl. 525-124.000.
Lenz, Wolfgang, to Steyr-Daimler-Puch Aktiengesellschaft. Apparatus for measuring the diameter of rod-shaped work-pieces. 4,531,294, Cl. 33-178.00R.
Leonard, John, Jr., to Teledyne Industries, Inc. Chaser position control. 4,531,866, Cl. 408-158.000.
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, to Institut Francais du Petrole. Process for synthesizing 1-butene by dimerization of ethylene. 4,532,370, Cl. 585-512.000.
Leroy, Michel: *See*—
Keinborg, Maurice; Varin, Philippe; Bertaud, Yves; and Leroy, Michel, 4,532,017, Cl. 204-67.000.
Lerude, Gerard: *See*—
Jullien, Claude; and Lerude, Gerard, 4,531,797, Cl. 339-61.00M.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-(Hydroxyalkyl or alkanoyloxymethyl)-1,6-naphthyridin-2(1H)-one and cardiotonic use thereof. 4,532,247, Cl. 514-299.000.
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, to Rhone-Poulenc Specialites Chimiques. Rapidly hardening organopolysiloxane compositions comprising polyacyloxysilane cross-linking agents. 4,532,315, Cl. 528-14.000.
Letron GmbH: *See*—
Schmidt, Hans J.; Diesel, Hans-Dieter; and Sauer, Burkhard, 4,532,157, Cl. 427-262.000.
Lever Brothers Company: *See*—
Boskamp, Jelles V., 4,532,064, Cl. 252-105.000.
Padron, Tamara; and Lopez, Ignacio, 4,532,067, Cl. 252-174.170.
Levine, Norman D. Elastic bodyband method and apparatus. 4,531,242, Cl. 2-243.00R.

Lewarchik, Ronald J.: *See—*
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,532,021, Cl. 204-159.160.

Lexen, Gerald: *See—*
Dreher, Gunther; and Lexen, Gerald, 4,531,431, Cl. 74-866.000.

Liautaud, James P.; Stultz, Peter F.; and Maloney, David L., to Liautaud, James P. Housing for a battery operated transceiver. 4,532,194, Cl. 429-99.000.

Liddell, Robert J.: *See—*
Kiernan, James G.; Liddell, Robert J.; and Henke, Ronald T., 4,531,535, Cl. 137-99.000.

Liddell, Stafford A. Y.: *See—*
Reggers, Charles G.; Cohr, Lindsay W. J.; and Liddell, Stafford A. Y., 4,531,520, Cl. 128-330.000.

Liehr, Manfred R.: *See—*
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Lilly Industries Limited: *See—*
Baker, Stephen R.; Lindstrom, Terry D.; Jamieson, William B.; and Ross, William J., 4,532,257, Cl. 514-470.000.

Limb, John O.: *See—*
Flores, Christopher; Gopinath, Bhaskarpillai; and Limb, John O., 4,532,626, Cl. 370-85.000.

Liming, Joseph L. Removable handle for a roller massager. 4,531,513, Cl. 128-57.000.

Lin, An-Chung R., to Exxon Research and Engineering Co. Heterologous ink jet ink compositions. 4,531,976, Cl. 106-27.000.

Lin, Yang-I: *See—*
Lang, Stanley A., Jr.; Fields, Thomas L.; Wilkinson, Raymond G.; Kang, Soon M.; and Lin, Yang-I, 4,532,349, Cl. 564-194.000.

Lindahl, Richard W., to Minnesota Mining and Manufacturing Company. Electrographic recording apparatus. 4,532,531, Cl. 346-153.100.

Lindborg, Ulf H.: *See—*
Vacha, Lubos J. B.; and Lindborg, Ulf H., 4,532,160, Cl. 427-434.500.

Linde Aktiengesellschaft: *See—*
Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, 4,531,367, Cl. 60-447.000.

Linder, Charles G., to Garrett Corporation, The. Intake vortex whistle silencing apparatus and methods. 4,531,356, Cl. 60-39.020.

Lindert, Andreas, to Parker Chemical Company. Water-based epoxy resins stable to hydrolysis. 4,532,309, Cl. 525-488.000.

Lindstrom, Alf I.: *See—*
Nasman, Lars E.; and Lindstrom, Alf I., 4,531,892, Cl. 417-205.000.

Lindstrom, Terry D.: *See—*
Baker, Stephen R.; Lindstrom, Terry D.; Jamieson, William B.; and Ross, William J., 4,532,257, Cl. 514-470.000.

Linkow, Leonard I.; and Hoffman, Leo. Detachable post for an osseous implant. 4,531,917, Cl. 433-176.000.

Linotek, Oy: *See—*
Hans, Lindqvist; and Vidar, Gronberg, 4,532,034, Cl. 210-112.000.

Lion Corporation: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Jun-ichi; and Ukigai, Toshiyuki, 4,532,053, Cl. 252-8.55D.

Littmann, Robert J., to Waterscience, Inc. Bleed-off elimination system and method. 4,532,045, Cl. 210-668.000.

Litton Resources Systems, Inc.: *See—*
McNeel, William O.; and Sackett, James A., 4,532,450, Cl. 310-329.000.

Litton Systems, Inc.: *See—*
Pamer, Karl A., 4,531,460, Cl. 105-150.000.

Liu, Chih-an: *See—*
Humphries, Michael J.; Liu, Chih-an; and Krutenat, Richard C., 4,532,191, Cl. 428-678.000.

Liu, Paul K. T.: *See—*
Groose, James E.; and Liu, Paul K. T., 4,531,953, Cl. 55-74.000.

Liu, Ping Y.; and Overton, David E., to General Electric Company. Blends of aromatic polycarbonate resin, olefin polymers or copolymers and acrylate- or methacrylate-copolymer resins. 4,532,282, Cl. 524-157.000.

Liu, Ping Y., to General Electric Company. Aromatic carbonate polymer composition. 4,532,283, Cl. 524-166.000.

Livet, Jean, to Honeywell Lucifer SA. Solenoid valve. 4,531,708, Cl. 251-48.000.

Lockheed Corporation: *See—*
Brunsicke, Wilhelm A., 4,531,588, Cl. 169-9.000.
Fritz, Harold B., 4,531,406, Cl. 73-290.00V.

Loersch, Joseph F.: *See—*
Jordan, Lester W.; Loersch, Joseph F.; and Adinolfi, Robert G., 4,532,403, Cl. 219-121.0ED.

Loewenstern, Kenneth; Clementi, Daniel M.; and Kipp, Glenn, to Ametek, Inc. Pressure transducer. 4,531,416, Cl. 73-735.000.

Lohr, Raymond J. Magnetic spinner. 4,531,923, Cl. 446-138.000.

Lohraff, Larry G.: *See—*
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Long, Charles C.; Lounsbury, David M.; and Curtin, Richard R., to Prime Computer, Inc. Apparatus for decoding phase encoded data. 4,532,559, Cl. 360-51.000.

Looney, Raymond H., to Baird Manufacturing Company. Fluid dampened back pressure regulator. 4,531,542, Cl. 137-514.700.

Loper, Bernd: *See—*
Renz, Dieter; and Loper, Bernd, 4,531,786, Cl. 301-37.0PB.

Lopez, Ignacio: *See—*
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L'Oreal: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,532,125, Cl. 424-47.000.

Lott, Thomas M. Golfer's aid. 4,531,743, Cl. 273-183.00B.

Lounsbury, David M.: *See—*
Long, Charles C.; Lounsbury, David M.; and Curtin, Richard R., 4,532,559, Cl. 360-51.000.

Loveless, Frederick C.; and Smudin, David J., to Uniroyal, Inc. Grafted polyalphaolefin polymers, method for its production and oils containing it. 4,532,061, Cl. 252-58.000.

Lowd, David L.; Sobolewski, Gerald J.; Lowd, Lynne R.; and Sobolewski, Barbara. Personal urinal device. 4,531,245, Cl. 4-144.300.

Lowd, Lynne R.: *See—*
Lowd, David L.; Sobolewski, Gerald J.; Lowd, Lynne R.; and Sobolewski, Barbara, 4,531,245, Cl. 4-144.300.

Lucas Industries: *See—*
Thomas, Gerald S.; Punshon, John; and Barr, John A., 4,531,496, Cl. 123-495.000.
Thornley, Derek; and Braithwaite, Jack, 4,532,570, Cl. 361-93.000.

Lucas, John J.: *See—*
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Lucas, Michael R., to United States of America, Navy. Method for interconnecting close lead center integrated circuit packages to boards. 4,531,285, Cl. 29-827.000.

Lucky, Bobby D., to Lucky Manufacturing Co. Radial arm timber saw and power controller therefor. 4,531,440, Cl. 83-471.200.

Lucky Manufacturing Co.: *See—*
Lucky, Bobby D., 4,531,440, Cl. 83-471.200.

Ludecke, Otto A.; and Stark, Terrence L., to General Motors Corporation. Diesel exhaust cleaner with alternating glow plug burner system. 4,531,363, Cl. 60-303.000.

Luhleich, Hartmut: *See—*
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,532,091, Cl. 264-29.500.

Lukac, Teodor; Soukup, Milan; and Widmer, Erich, to Hoffmann-La Roche Inc. Process for the manufacture of 3-hydroxy-2,6,6,-trimethyl-2 cyclohexen-1-one. 4,532,358, Cl. 568-341.000.

Lukas, David C.; Moser, James R.; and Schlough, James R., to Stobb, Inc. Method and apparatus for controlling sheets in a hopper. 4,531,724, Cl. 271-166.000.

Lukens, Raymond J.: *See—*
Schinski, William L.; and Lukens, Raymond J., 4,531,968, Cl. 71-98.000.

Lummus Company, The: *See—*
Khonsari, Ali M.; and Suciu, George D., 4,532,012, Cl. 203-53.000.

Lund, Richard M.: *See—*
Corby, Nelson R., Jr.; Lund, Richard M.; and Peroutky, Donald C., 4,532,405, Cl. 219-124.340.
Povlick, Thomas P.; and Lund, Richard M., 4,532,406, Cl. 219-124.340.

Lundberg, Robert D.: *See—*
Wagensommer, Joseph; Klein, Robert R.; and Lundberg, Robert D., 4,532,302, Cl. 525-343.000.

Luppi, Libero; and Calari, Alessandro, to Dideco S.p.A. Centrifugal plasmapheresis device. 4,531,932, Cl. 604-6.000.

Lurssen, Klaus: *See—*
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,532,341, Cl. 549-559.000.

Lutz, Alfons: *See—*
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Lynch Machinery: *See—*
Hileman, Kenneth R.; Shields, Ronald H.; and Tobey, Lance M., 4,531,961, Cl. 65-164.000.

Lynch, William R.: *See—*
Jonas, Rodger H.; Beel, Joseph W.; and Lynch, William R., 4,532,147, Cl. 426-655.000.

M.A.N.-Maschinenfabrik Augsburg Nurnberg: *See—*
Dreher, Gunther; and Lexen, Gerald, 4,531,431, Cl. 74-866.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
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M&T Chemicals Inc.: *See—*
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MacDonald, Robert C., to Northwestern University. Method of preparing giant size liposomes. 4,532,089, Cl. 264-4.300.

MacKeighen, Harold R.; and Cortesi, Vincent T., to Alfred D. Lobo Co., L.P.A. Elastomer compositions containing humates. 4,532,260, Cl. 521-84.100.

MacNitt, Donald G., Jr.; Walker, Raymond M.; and Walker, Bryant H., to United Technologies Corporation. Forging die package. 4,531,396, Cl. 72-354.000.

Maddalozzo, Raymond J., to Dresser Industries, Inc. Hydraulic control valve with fluid dampening system. 4,531,709, Cl. 251-48.000.

Madge, Werner; Vogelhuber, Peter; Stellmach, Dieter; and Hauger, Josef, to Kienzle Apparatus GmbH. Printing apparatus of modular construction having a rotatable printhead and plural print stations. 4,531,852, Cl. 400-692.000.

Madsac, Michel; and Hiron, Thierry, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Surface hardening process for metal parts. 4,531,984, Cl. 148-16.600.

Maeda, Keikichi; and Iijima, Takahiro, to JGC Corporation. Process for providing an apparatus for treating hydrocarbons or the like at high temperatures substantially without carbon deposition. 4,532,109, Cl. 422-240.000.

Maeda, Takeshi: *See*—
Tsunoda, Yoshito; Maeda, Takeshi; Nakamura, Shigeru; and Kaku, Toshimitsu, 4,532,522, Cl. 346-44.000.
Magill, Robert J.; Gaiger, David J.; and Simkins, Neil, to Actionair Equipment Limited. Spring-powered actuator. 4,531,534, Cl. 137-75.000.
Mahar, Ralph W., to Eastman Kodak Company. Base coat compositions for wet-on-wet applications, and articles coated therewith. 4,532,177, Cl. 428-328.000.
Maier, Helmut K., to Henkel Corporation. Method of suspension polymerization of vinyl chloride utilizing hydroxypropyl guar. 4,532,314, Cl. 526-200.000.
Mailloux, Dennis R.: *See*—
Kniazzeh, Alfredo G.; Mailloux, Dennis R.; and Norvaisa, Kestutis, 4,532,193, Cl. 429-82.000.
Maine, Reuben E., to Sperry Corporation. Differential receiver. 4,532,637, Cl. 375-10.000.
Maj, Joseph J.: *See*—
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Majette, Joseph P. Method and apparatus for spinning yarn under constant tension. 4,531,353, Cl. 57-94.000.
Makal, John M.: *See*—
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Iliev, Maxim D.; Kervanbashiev, Stoyu S.; Karamanski, Stefan D.; and Makedonski, Frederik M., 4,532,431, Cl. 290-4.00R.
Makino, Kazuhiro: *See*—
Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, 4,531,647, Cl. 212-147.000.
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Mannesmann Rexroth GmbH: *See*—
Reith, Werner, 4,531,449, Cl. 91-420.000.
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Wener, Kenneth R., 4,532,618, Cl. 367-46.000.
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Di Benedetto, Dominique; and Marchand, Jean-Claude, 4,531,398, Cl. 73-1.00G.
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Corney, John M., 4,532,630, Cl. 371-68.000.
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Gerard, Roger E. J., 4,532,480, Cl. 330-286.000.
Wilkinson, Dent P., 4,532,636, Cl. 375-1.000.
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Kobiske, Michael; Voigt, William; and Sharma, Kris, 4,531,618, Cl. 188-321.110.
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Lamer, Gerald P., 4,531,604, Cl. 180-152.000.
Markley, George L., to Ingersoll-Rand Company. Uni-directional flow, fluid valve. 4,531,543, Cl. 137-515.700.
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Bally, Diego, 4,531,818, Cl. 354-83.000.
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Howard, Fred; Edson, Sydney; Merl, Milton J.; and Di Marchi, Silvio J., 4,531,311, Cl. 40-10.00R.
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Shetty, Jayarama K.; and Marshall, James J., 4,532,213, Cl. 435-225.000.
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Martin, John R., 4,531,683, Cl. 242-68.300.
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Raabe, Thomas; Bohn, Helmut; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,532,239, Cl. 514-247.000.
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Numakura, Hirotomo, 4,531,355, Cl. 59-11.000.
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Mary Ellen Enterprises Inc.: *See*—
Cleveland, George D., 4,531,635, Cl. 206-457.000.
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Massachusetts Institute of Technology: *See*—
Crespi, Charles L.; and Thilly, William G., 4,532,204, Cl. 435-29.000.
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Mateus, Ernesto. Helicopter flight control and transmission system. 4,531,692, Cl. 244-17.190.
Matlack, Albert S., to HIMONT Incorporated. Method for preparing an improved catalyst support, Ziegler-Natta catalyst utilizing said support and polymerization of 1-olefins utilizing said catalyst. 4,532,313, Cl. 526-125.000.
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Matsushita Electric Industrial Company, Limited: *See*—
Nagayasu, Kuniaki; Konno, Setsuzou; and Yoshida, Toshio, 4,531,305, Cl. 34-31.000.
Suzuki, Jiro; Shimoda, Hisanori; and Kodama, Hisashi, 4,531,677, Cl. 239-520.000.
Todoroki, Tsunehiko; Hayakumo, Tadahiko; and Fukuda, Katsumi, 4,531,988, Cl. 148-402.000.
Matsushita Electric Works, Ltd.: *See*—
Nagamoto, Mitsuki; and Kubota, Takuo, 4,532,487, Cl. 335-128.000.
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Yamamoto, Sakuei; Inao, Hiroshi; Nishida, Mitsuhiro; Matsushita, Matao; and Komoda, Hidemi, 4,532,446, Cl. 310-87.000.
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Kawai, Hideki; Nishihara, Hidetoshi; Nakaoka, Seishi; and Hamada, Koushi, 4,531,894, Cl. 417-312.000.
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Seragnoli, Enzo; Mattei, Riccardo; and Dall'Osso, Gastone, 4,531,629, Cl. 198-458.000.
Mattel, Inc.: *See*—
Newbold, Roger A., 4,532,622, Cl. 369-271.000.
Matthei, Ernst A., to Devalit-Plastik van Deest GmbH & Co. KG. Injection molding machine. 4,531,704, Cl. 249-67.000.
Matthew, John B.; and Kirchner, Edward C., to Beloit Corporation. Flexible disk refiner and method. 4,531,681, Cl. 241-146.000.
Matthews, David J., to Perkin-Elmer Corporation, The. System for periodically reading all memory locations to detect errors. 4,532,628, Cl. 371-13.000.
Matthews, John C.; Ury, Michael G.; Wood, Charles H.; and Greenblatt, Marshal, to Fusion Systems Corp. Method and apparatus for performing deep UV photolithography. 4,532,427, Cl. 250-492.200.

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Uzaki, Nagato; Matui, Kazuharu; Toyoda, Shigehiro; and Hikita, Katuro, 4,531,565, Cl. 164-160.100.
Mauer, Daniel E.: *See*—
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Maytag Company, The: *See*—
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Kuecker, Pamela M., 4,531,307, Cl. 34-48.000.
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Briggs, Peter J.; and McAloon, Kevin, 4,532,176, Cl. 428-288.000.
McClelland, Donald R., to Rubbermaid Incorporated. Ovenware receptacle system. 4,532,397, Cl. 219-10.55E.
McCormick, Thomas E.: *See*—
Jacobson, James; and McCormick, Thomas E., 4,531,737, Cl. 273-65.00R.
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Jaquiss, Donald B. G.; McCready, Russell J.; and Tyrell, John A., 4,532,290, Cl. 524-417.000.
McCurdy, Frederic, to Graphic Technology, Inc. Portable viewing apparatus. 4,531,317, Cl. 40-366.000.
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Elliott, Guy R. B.; McDaniel, Milton W.; and Houseman, Barton L., 4,531,593, Cl. 175-71.000.
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McDonald, Philip S.: *See*—
McDonald, J. Ralph; and McDonald, Philip S., 4,531,514, Cl. 128-75.000.
McDonnell Douglas Corporation: *See*—
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McDonough, Kevin C.: *See*—
Roskell, Derek; Schabowski, John V.; Guttag, Karl M.; and McDonough, Kevin C., 4,532,587, Cl. 364-200.000.
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Hurley, James R., 4,532,471, Cl. 324-110.000.
McHargue, Carl J., to United States of America, Energy. Method for producing hard-surfaced tools and machine components. 4,532,149, Cl. 427-38.000.
McLean, Kenneth W.: *See*—
Ehrhart, Philip J.; Makofka, Stanley J.; and McLean, Kenneth W., 4,531,349, Cl. 56-13.600.
McMillen, James M., to Mobil Oil Corporation. Method of solvent stimulation of heavy oil reservoirs. 4,531,586, Cl. 166-305.00R.
McNeel, William O.; and Sackett, James A., to Litton Resources Systems, Inc. Compound piezoelectric accelerometer with residual voltage matching. 4,532,450, Cl. 310-329.000.
McNeely, Michael L., to RCA Corporation. Method of making a video disc from a disc preform. 4,532,095, Cl. 264-107.000.
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Rudish, Ronald M.; and McVeigh, Peter J., 4,532,519, Cl. 343-372.000.
McVicker, Gary B., to Exxon Research and Engineering Co. Carbonylation process. 4,532,325, Cl. 546-2.000.
McVicker, Gary B.: *See*—
Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., 4,532,229, Cl. 502-330.000.
Mead Corporation, The: *See*—
Arney, Jonathan S.; and Adair, Paul C., 4,532,200, Cl. 430-138.000.
DuVall, Dale R., 4,532,602, Cl. 364-577.000.
Shackle, Dale R.; Cousin, Michael J.; and Pack, Gary D., 4,532,183, Cl. 428-402.220.
Meade, Donn W., to Dennison National Company. Expandable envelope file. 4,531,667, Cl. 229-1.50R.
Mears, Eric, to Cordell Engineering, Inc. Item transporting. 4,531,821, Cl. 354-320.000.
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Fuchs, Ernst; and Dudli, Andreas, 4,532,035, Cl. 210-150.000.
Mecom Standard Limited: *See*—
Alway, Peter, 4,532,415, Cl. 235-131.00R.
Med-West, Incorporated: *See*—
Berryessa, Richard, 4,531,935, Cl. 604-45.000.
Medtronic, Inc.: *See*—
Anderson, Katherine H., 4,531,523, Cl. 128-419.0PT.
Meeks, Jasper L.; and Corney, John D. Water treatment device. 4,532,040, Cl. 210-222.000.
Meese, William G.; Pratt, Robert G.; Charneski, Mitchell D.; Brokenshire, Robert E.; and Whitney, Bruce F., to Detroit Edison Company, The. Microprocessor electric vehicle charging and parking meter system structure and method. 4,532,418, Cl. 235-381.000.
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Larson, Bert R.; Wartenbergh, Robert P.; Warszawski, Janusz; Meier, Markus; Sutton, David A.; Ho, Bin-Lun; and Bronshvatch, Efim, 4,532,564, Cl. 360-97.000.
Meister-Beck, Margrith, heir: *See*—
Meister, Erwin, deceased, 4,531,540, Cl. 137-492.500.
Meister, Erwin, deceased (by Meister-Beck, Margrith, heir), to Von Roll Hydraulik AG. Servocontrolled pressure limiting valve. 4,531,540, Cl. 137-492.500.
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Vandenberg, John H.; and Mendenhall, Michael J., 4,531,309, Cl. 36-117.000.
Menezes, William A.; and Kuper, Douglas D., to Sony Corporation. Apparatus for selectively transferring data between registers. 4,532,502, Cl. 340-717.000.
Mensah, Thomas O.: *See*—
Kar, Gitimoy; and Mensah, Thomas O., 4,531,959, Cl. 65-3.110.
Mensink, Kornelis A.; and Brouwer, Hendrik L., to Vitafin N.V. CMOS Circuits with parameter adapted voltage regulator. 4,532,467, Cl. 323-316.000.
Merck & Co., Inc.: *See*—
Hartman, George D.; and Phillips, Brian T., 4,532,237, Cl. 514-226.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Hartner, Hartmut, 4,532,369, Cl. 585-428.000.
Scherowsky, Gunter; and Butow, Michael, 4,532,069, Cl. 252-299.100.
Merl, Milton J.: *See*—
Howard, Fred; Edson, Sydney; Merl, Milton J.; and Di Marchi, Silvio J., 4,531,311, Cl. 40-10.00R.
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Terrier, Gerard, 4,532,486, Cl. 335-13.000.
Merryman, Bill. Illuminated interconnectable sign module. 4,532,579, Cl. 362-239.000.
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Lechner, Manfred; and Stich, Kurt, 4,531,271, Cl. 29-157.00C.
Metallgesellschaft Aktiengesellschaft: *See*—
Doerges, Alexander; Schlauer, Johann; Kriebel, Manfred; and Hude, Anton, 4,532,116, Cl. 423-226.000.
Metromail Corporation: *See*—
Bornstein, Michael, 4,531,726, Cl. 271-263.000.
Watson, Virgil A., 4,531,723, Cl. 271-14.000.
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Meyborg, Holger: *See*—
Rasshofer, Werner; Balle, Gerhard; Dieterich, Dieter; and Meyborg, Holger, 4,532,266, Cl. 521-159.000.
Meyer, Horst: *See*—
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.
Meyer, Jacques; and Scharen, Walter, to Siegfried Aktiengesellschaft. Weed control method and composition. 4,531,965, Cl. 71-92.000.
Meza, Peter J.; and de la Plaza, Alex, to Harris Corporation. High voltage current mirror. 4,532,481, Cl. 330-288.000.
Miasek, Peter G.: *See*—
Black, Laura E.; Miasek, Peter G.; and Adriaens, Georges, 4,532,029, Cl. 208-308.000.
Michael Horauf Maschinenfabrik GmbH & Co. KG: *See*—
Clauss, Gerhard, 4,531,930, Cl. 493-108.000.
Michigan Consolidated Gas Co.: *See*—
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Mickelson, Elliot S.: *See*—
Campbell, Clarence R.; Mickelson, Elliot S.; and Baumgartner, Steven A., 4,532,098, Cl. 264-320.000.
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Cunisse, Michel; Granier, Patrick; D'Hollosy, Antoine; and De Pinho, Daniel, 4,531,839, Cl. 366-110.000.
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Miles Laboratories, Inc.: *See*—
Shetty, Jayarama K.; and Marshall, James J., 4,532,213, Cl. 435-225.000.
Siddigi, M. Sultan, 4,532,107, Cl. 422-56.000.
Wang, Joseph Y., 4,532,216, Cl. 436-2.000.
Millar, Robert F.: *See*—
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Millay, Lawrence I.: *See*—
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Miller, David S. Apparatus for cryogenic branding. 4,531,476, Cl. 119-1.000.

Miller, Kenneth G., to Inspiron Corporation. Heated respiratory therapy humidifier. 4,532,088, Cl. 261-142.000.

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Engels, Walter, 4,531,265, Cl. 26-9.000.

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Mimori, Teruo: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Minasy, Arthur J., to Knogo Corporation. Theft detection system target fastener. 4,531,264, Cl. 24-155.0BR.

Minnesota Mining and Manufacturing Company: *See*—
Balchunis, Robert J.; and Sher, Frank T., 4,532,185, Cl. 428-447.000.
Hagen, Donald F.; and Marhevka, John S., 4,532,219, Cl. 436-155.000.
Lindahl, Richard W., 4,532,531, Cl. 346-153.100.

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Mioduski, Paul, to RDM International, Inc. Circuit apparatus and method for electrothermal treatment of cancer eye. 4,531,524, Cl. 128-422.000.

Mirviss, Stanley B., to Stauffer Chemical Company. Phosphate ester recovery. 4,532,085, Cl. 260-990.000.

Mishima, Ryoji; and Miyamoto, Hitoshi, to Kasei Naoetsu Light Metal Industries, Ltd. Process for producing superplastic aluminum alloy strips. 4,531,977, Cl. 148-2.000.

Mistry, Dalpat D.: *See*—
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Mitamura, Masayoshi: *See*—
Yamaguchi, Keiki; Ogawa, Tadashi; Mitamura, Masayoshi; and Shimizu, Tooru, 4,532,644, Cl. 378-16.000.

Mitani, Tsuneyoshi: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Sagara, Kikuo; and Kojima, Masanori, 4,532,555, Cl. 358-310.000.
Uetani, Kenichi; and Umeda, Yasukazu, 4,531,616, Cl. 187-29.00R.
Yamamoto, Sakuei; Inao, Hiroshi; Nishida, Mitsuhiro; Matsushita, Matao; and Komoda, Hidemi, 4,532,446, Cl. 310-87.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugio, Akitoshi; and Okabe, Masao, 4,532,306, Cl. 525-397.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, 4,532,308, Cl. 525-482.000.

Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See*—
Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, 4,532,308, Cl. 525-482.000.

Mitsui Petrochemical Industries Ltd.: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Miura, Takeshi, to Nippon Oil Seal Industry Co., Ltd. Extended wear annular oil seal. 4,531,747, Cl. 277-134.000.

Miura, Tatsuo; Ohta, Kazuhiro; Hasegawa, Yoshiharu; and Yoneyama, Takao, to Granges Metallverken AB. Corrosion resisting copper alloy. 4,531,980, Cl. 148-11.50C.

Miura, Yoshiharu; Miyamoto, Kazuhisa; and Yagi, Kiyohito. Process for producing hydrogen by alga in alternating light/dark cycle and environmental aerobic/microaerobic conditions. 4,532,210, Cl. 435-168.000.

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Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, 4,532,254, Cl. 514-456.000.

Miwa, Tadashi; Kimura, Kiyoshi; Okamoto, Yukio; and Tarumi, Noriyoshi, to Konishiroku Photo Industry Co., Ltd. Electrostatic reproducing apparatus having an intermediate toner image transfer member. 4,531,825, Cl. 355-3.0TR.

Miyairi, Shota. Circuit for reducing harmonics and pulsation in multiplex polyphase rectifying circuits or inverters, respectively provided with interphase reactors. 4,532,581, Cl. 363-39.000.

Miyake, Hitomi: *See*—
Fujikawa, Tetsuzo; Tamba, Shinichi; and Miyake, Hitomi, 4,531,487, Cl. 123-198.0DC.

Miyamoto, Hitoshi: *See*—
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Miyamoto, Kazuhisa: *See*—
Miura, Yoshiharu; Miyamoto, Kazuhisa; and Yagi, Kiyohito, 4,532,210, Cl. 435-168.000.

Miyamoto, Sigeru: *See*—
Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, 4,531,555, Cl. 139-429.000.

Miyamoto, Tomohiko: *See*—
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, 4,531,949, Cl. 48-202.000.

Miyazaki, Hiroaki: *See*—
Iiyama, Akihiro; Miyazaki, Hiroaki; Etoh, Yukihiro; and Tanaka, Toshiaki, 4,531,491, Cl. 123-357.000.

Miyazaki, Masayuki: *See*—
Iwamoto, Masatami; Nakamura, Shiro; Miyazaki, Masayuki; and Yoshioka, Sumio, 4,532,445, Cl. 310-52.000.

Mizuhara, Howard, to GTE Products Corporation. Thermally insulated piston. 4,531,502, Cl. 123-668.000.

Mizukami, Yukihiro. Lighter case having windshield. 4,531,906, Cl. 431-146.000.

Mizuno, Kenji: *See*—
Onoda, Hiroshi; and Mizuno, Kenji, 4,532,521, Cl. 346-33.00R.

Mizuno, Yoshikazu; and Ikuma, Akira, to Nippondenso Co., Ltd. Control circuit system for automobiles. 4,532,432, Cl. 307-10.00R.

Mizutani, Takeshi: *See*—
Hirabayashi, Masao; and Mizutani, Takeshi, 4,531,853, Cl. 401-265.000.

Mobil Oil Corporation: *See*—
Anthes, Robert J.; and Kremer, Ross A., 4,532,033, Cl. 209-166.000.
Chu, Chin-Chiun, 4,532,226, Cl. 502-71.000.
Herrington, F. John, 4,532,652, Cl. 383-103.000.
Horodysky, Andrew G.; and Herd, Richard S., 4,532,056, Cl. 252-49.600.
Horodysky, Andrew G.; and Landis, Phillip S., 4,532,057, Cl. 252-49.800.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,532,263, Cl. 521-133.000.
McMillen, James M., 4,531,586, Cl. 166-305.00R.
Nevel, Donald E., 4,531,400, Cl. 73-12.000.
Okorodudu, Abraham O. M., 4,532,084, Cl. 260-978.000.
Phelps, Craig H.; and Sampath, Krishnaswamy, 4,531,404, Cl. 73-38.000.
Strom, E. Thomas, 4,532,218, Cl. 436-82.000.
Tsao, Ying-Yen P.; and Wong, Stephen S., 4,532,225, Cl. 502-62.000.
Wu, Wen-Pao; and Krutchen, Charles M., 4,532,094, Cl. 264-53.000.

Modine Manufacturing Company: *See*—
Stay, Kevin E.; and Munch, John E., Jr., 4,531,578, Cl. 165-175.000.

Modular Controls Corporation: *See*—
Kosarzecki, Constantine, 4,531,536, Cl. 137-111.000.

Moery, Ronald J.: *See*—
Fox, James W.; Moery, Ronald J.; and Banas, Kenneth P., 4,532,394, Cl. 200-275.000.

Moffatt, James P.: *See*—
Green, Donald R., Jr.; and Moffatt, James P., 4,532,477, Cl. 330-149.000.

Mohr, Peter R., to Erhardt & Leimer GmbH. Readable goods-marking system for textile processing. 4,532,167, Cl. 428-78.000.

Molaug, Ole, to Graco Robotics, Inc. Device for robot manipulator. 4,531,885, Cl. 414-735.000.

Molitor, Victor D. Method of and unit for recovery of waste energy. 4,531,572, Cl. 165-1.000.

Moller, Dieter: *See*—
Lenz, Werner; Sander, Hans; and Moller, Dieter, 4,532,300, Cl. 525-124.000.

Molnar, Francois; Szabo, Suzanne; Statkov, Peter R.; Armijo, Manuel; Sunkel, Carlos; and Cillero, Fernando. Derivatives of p-acylaminophenol having a therapeutic action, and compositions having a therapeutic action containing said derivatives as pharmacologically active ingredients. 4,532,249, Cl. 514-324.000.

Moniotte, Philippe G.: *See*—
Delseth, Jean-Marc; Mauer, Daniel E.; and Moniotte, Philippe G., 4,532,080, Cl. 556-139.000.

Monroe, Patrick G.: *See*—
Edson, James B.; and Monroe, Patrick G., 4,532,507, Cl. 340-825.310.

Monsanto Co.: *See*—
Chupp, John P.; Ku, Audrey Y.; Neumann, Thomas E.; and Nickson, Thomas E., 4,532,353, Cl. 564-442.000.
Holtrop, James S.; and Maurer, Richard P., 4,531,994, Cl. 156-307.300.

Monsanto Europe, S.A.: *See*—
Delseth, Jean-Marc; Mauer, Daniel E.; and Moniotte, Philippe G., 4,532,080, Cl. 556-139.000.

Monta, Alain: *See*—
Coquil, Bernard; and Monta, Alain, 4,531,918, Cl. 434-118.000.

Montagna, Angelo A.: *See*—
Fiato, Rocco A.; McVicker, Gary B.; and Montagna, Angelo A., 4,532,229, Cl. 502-330.000.

Montedison S.p.A.: *See*—
Venturello, Carlo; and Ricci, Marco, 4,532,079, Cl. 260-413.000.

Mookherjee, Braja D.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,532,359, Cl. 568-346.000.

Mooney Chemicals, Inc.: *See*—
Collins, Albert V.; and Asmus, Richard W., 4,532,161, Cl. 427-440.000.

Moore, John P.: *See*—
Aufiero, James M.; D'Agostino, William P., Jr.; and Moore, John P., 4,532,546, Cl. 358-111.000.

Moreau, Claude R. M. Compact manufacturing system for forming soft goods, mainly toys. 4,531,925, Cl. 446-369.000.

Moretti, Luciano: *See*—
Dotti, Giulio; Moretti, Luciano; and Costelli, Ugo, 4,531,707, Cl. 251-44.000.

Mori, Fumio: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.

Mori, Kazuhiko: *See*—
Yamashita, Tsukasa; Mori, Kazuhiko; Matano, Masaharu; and Ota, Norihiro, 4,532,632, Cl. 372-50.000.

Mori Manufacturing Co., Ltd.: *See*—
Mori, Masami, 4,531,756, Cl. 280-279.000.

Mori, Masami, to Mori Manufacturing Co., Ltd. Two-wheeled vehicle head parts assembly. 4,531,756, Cl. 280-279.000.

Mori, Yasuyuki: *See*—
Matsuda, Norio; Konno, Toshio; Yamamoto, Kaneo; Tominaga, Shinya; Kubo, Susumu; Mori, Yasuyuki; Akiyama, Naoki; and Murakami, Masaki, 4,532,620, Cl. 369-136.000.

Mori, Yoshihisa: *See*—
Shibagaki, Kazuyoshi; Mori, Yoshihisa; and Moriuchi, Takahiko, 4,532,186, Cl. 428-457.000.

Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Jun-ichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,532,053, Cl. 252-8.55D.

Moriuchi, Takahiko: *See*—
Shibagaki, Kazuyoshi; Mori, Yoshihisa; and Moriuchi, Takahiko, 4,532,186, Cl. 428-457.000.

Moriya, Yukio; Yoda, Tadashi; and Fukumoto, Hisashi, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit system for use in swivel type excavators. 4,531,366, Cl. 60-421.000.

Morris, Arthur J.: *See*—
Pringle, Ronald E.; and Morris, Arthur J., 4,531,581, Cl. 166-120.000.

Morris, James A.; Hancock, Curtis L.; and Wiley, John L., to Spectrum Manufacturing Inc. Counting stamper apparatus. 4,532,642, Cl. 377-15.000.

Morris, William W., to X-Cel X-Ray Corporation. Quick release and adjustable collimator device. 4,532,645, Cl. 378-147.000.

Mortvedt, Raymond L.; and Thompson, Steven M., to Ektelon. Racquetball racquet with increased hitting area. 4,531,738, Cl. 273-73.00C.

Moryl, Richard; and Bouery, Roger, to Compagnie de Materiel et D'Equipements Techniques. Devices for securing objects to metal sheets accessible from only one side. 4,531,870, Cl. 411-108.000.

Mosbach, Klaus: *See*—
Larsson, Per-Olof; Mosbach, Klaus; and Borchert, Axel, 4,532,232, Cl. 502-403.000.

Moser, James R.: *See*—
Lukas, David C.; Moser, James R.; and Schlough, James R., 4,531,724, Cl. 271-166.000.

Moss, Robert D., to Tennessee Valley Authority. Condenser targeted chlorination injection system. 4,531,571, Cl. 165-1.000.

Mosser, Mark F.; and Fabiny, William J., to Sermatech International, Inc. Primer coating composition. 4,532,289, Cl. 524-406.000.

Moteurs Leroy-Somers: *See*—
Renard, Michel, 4,532,465, Cl. 318-814.000.

Motornetics Corporation: *See*—
Welburn, Ross D., 4,532,448, Cl. 310-163.000.

Motorola, Inc.: *See*—
Countryman, Roger S., Jr., 4,532,611, Cl. 365-200.000.

Mouri, Yasunori; Abe, Osamu; and Teragakiuchi, Akira, to Hitachi, Ltd. Electronic control method and apparatus for internal combustion engine. 4,532,593, Cl. 364-431.110.

Mouton, Pierre C., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." . Multiple chamber coaxial hydraulic jack and control system therefor. 4,531,451, Cl. 92-108.000.

MTS Systems Corporation: *See*—
Andersen, Dennis H., 4,531,901, Cl. 425-150.000.

Mucha, George M.: *See*—
Pfaffmann, George D.; and Mucha, George M., 4,531,987, Cl. 148-150.000.

Muchow, John D., to Hydril Company. Drilling choke valve. 4,531,545, Cl. 137-625.390.

Muchowski, Joseph M.; and Guzman, Angel, to Syntex (U.S.A.) Inc. Thiazolidin-2-one analogs. 4,532,138, Cl. 514-369.000.

Muck, Jack E., to AccuSpray, Inc. Spray nozzle. 4,531,675, Cl. 239-290.000.

Mueller, Walter B., to W. R. Grace & Co., Cryovac Div. Linear polyethylene shrink films. 4,532,189, Cl. 428-516.000.

Muench, Frank J., Jr.; and Makal, John M., to RTE Corporation. Dual voltage switch. 4,532,386, Cl. 200-11.0TC.

Mughal, Ahmed S., to John Wyeth & Brother Limited. Oxaprozin calcium salt pharmaceutical compositions. 4,532,253, Cl. 514-374.000.

Mukai, Tadashi: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Muller, Beat, to Ciba-Geigy Corporation. N-(hydroxypolyoxaalkylene)phthalimides and succinimides and acrylate esters thereof. 4,532,332, Cl. 548-473.000.

Muller, Christina: *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Muller, Christina; Kober, Roland; and Renker, Wolfgang, 4,532,068, Cl. 252-188.280.

Muller, Jakob; and Diesner, Ferdinand, to Textilma AG. Weaving machine and a method for production of a ribbon-type fastener. 4,531,554, Cl. 139-116.000.

Muller, Klaus: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; and Reber, Harald, 4,532,013, Cl. 204-1.00T.

Multinorm B.V.: *See*—
Paques, Gerardus H. F., 4,531,880, Cl. 414-473.000.

Munch, John E., Jr.: *See*—
Stay, Kevin E.; and Munch, John E., Jr., 4,531,578, Cl. 165-175.000.

Mundie, Craig J.: *See*—
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Murakami, Masaki: *See*—
Matsuda, Norio; Konno, Toshio; Yamamoto, Kaneo; Tominaga, Shinya; Kubo, Susumu; Mori, Yasuyuki; Akiyama, Naoki; and Murakami, Masaki, 4,532,620, Cl. 369-136.000.

Murata Manufacturing Co., Ltd.: *See*—
Inoue, Jiro, 4,532,451, Cl. 310-353.000.
Ito, Katsuo; Yoshimura, Kazunori; Tsuji, Kazuhiro; and Kontani, Kazuo, 4,532,485, Cl. 334-51.000.
Sakamoto, Yukio; and Tanabe, Takeshi, 4,532,573, Cl. 361-307.000.

Murayama, Hirokazu: *See*—
Ogata, Yohji; Aida, Isao; Murayama, Hirokazu; and Shibuya, Kenjiro, 4,532,409, Cl. 219-137.00R.

Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., to DeSoto, Inc. Adherent ultraviolet cured coatings. 4,532,021, Cl. 204-159.160.

Murphy, Joseph: *See*—
Murray, Myles N.; and Murphy, Joseph, 4,531,281, Cl. 29-570.000.

Murphy, Robert J., Jr., to NL Industries, Inc. Apparatus and method for excluding gas from a liquid. 4,531,952, Cl. 55-36.000.

Murray, Myles N.; and Murphy, Joseph, to Industrial Electronic Rubber Company. Method useful in the manufacture of electrolytic capacitors. 4,531,281, Cl. 29-570.000.

Murrenhoff, Hubertus: *See*—
Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, 4,531,367, Cl. 60-447.000.

Murther, Howard D. Over ride oil pump. 4,531,485, Cl. 123-196.00S.

Musashi Co., Ltd.: *See*—
Sasaoka, Takashi; and Mitani, Tsuneyoshi, 4,532,421, Cl. 250-223.00R.
Sato, Koji; and Kawano, Hikaru, 4,531,344, Cl. 53-447.000.

Musashi Engineering Kabushiki Kaisha: *See*—
Sasaoka, Takashi; and Mitani, Tsuneyoshi, 4,532,421, Cl. 250-223.00R.

Muse, John F.; Riddle, Harry W.; Zeiler, Frank S.; and Buruato, Juventino, to Baker Oil Toóls, Inc. Well conduit centralizer. 4,531,582, Cl. 166-241.000.

Musso, Pietro: *See*—
Valle, Franco; and Musso, Pietro, 4,531,850, Cl. 400-551.000.

Mutai, Masahiko: *See*—
Sako, Tomoyuki; Sawaki, Saeko; Sakurai, Toshizo; Mutai, Masahiko; and Kondo, Isamu, 4,532,211, Cl. 435-172.300.

Muto, Shinichiro: *See*—
Sato, Kuniaki; Muto, Shinichiro; Yanagishima, Fumiya; and Shimoyama, Yuji, 4,531,904, Cl. 431-10.000.

Mutschler, Erich: *See*—
Botz, Jakob; Mutschler, Erich; Prohaska, Hans; Schmid, Eckhardt; and Scholl, Wolfgang, 4,531,419, Cl. 74-388.0PS.

Myson Group Limited: *See*—
Webster, Dennis M., 4,531,575, Cl. 165-78.000.

N.I. Industries, Inc.: *See*—
Nee, Michael A., 4,531,445, Cl. 89-1.813.

Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, to BASF Aktiengesellschaft. Electrically conductive pyrrole copolymer article. 4,532,188, Cl. 428-500.000.

Naegeli, Robert W., to Autoquip Corporation. Fork truck service lift. 4,531,614, Cl. 187-8.500.

Nagahara, Shusaku: *See*—
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.

Nagamoto, Mitsuki; and Kubota, Takuo, to Matsushita Electric Works, Ltd. Relay structure. 4,532,487, Cl. 335-128.000.

Nagasaki, Humiko: *See*—
Ueda, Akiyoshi; Nagasaki, Humiko; Takakura, Yutaka; and Kojima, Shigeru, 4,532,363, Cl. 568-424.000.

Nagase, Hiroshi: *See*—
Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, 4,532,464, Cl. 318-807.000.

Nagayasu, Kuniaki; Konno, Setsuzou; and Yoshida, Toshio, to Matsushita Electric Industrial Company, Limited. Method and apparatus for controlling a clothes dryer. 4,531,305, Cl. 34-31.000.

Nakagawa, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Device and method for recording information on a disk. 4,532,621, Cl. 369-111.000.

Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, to Sinto Kogio, Ltd. Composite and durable forming model with permeability. 4,531,705, Cl. 249-134.000.

Nakahira, Hiroshi; and Kubo, Shigeki, to Sumitomo Metal Mining Company Limited. Process for producing antimony trioxide having a low alpha-ray strength. 4,532,112, Cl. 423-87.000.

Nakai, Masaaki: *See*—
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.

Nakajima, Kichio: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,531,369, Cl. 60-456.000.

Nakajima, Yukio, to Olympus Optical Co., Ltd. Focus detector with characteristic point detection. 4,532,420, Cl. 250-201.000.

Nakamura, Shigeru: *See*—
Tsunoda, Yoshito; Maeda, Takeshi; Nakamura, Shigeru; and Kaku, Toshimitsu, 4,532,522, Cl. 346-44.000.

Nakamura, Shiro: *See*—
Iwamoto, Masatami; Nakamura, Shiro; Miyazaki, Masayuki; and Yoshioka, Sumio, 4,532,445, Cl. 310-52.000.

Nakamura, Takashi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Process for the preparation of phosphor. 4,532,071, Cl. 252-301.40H.

Nakano, Takuo: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Nakano, Tomio: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Ohira, Tsuyoshi, 4,532,613, Cl. 365-230.000.

Nakaoka, Seishi: *See*—
Kawai, Hideki; Nishihara, Hidetoshi; Nakaoka, Seishi; and Hamada, Koushi, 4,531,894, Cl. 417-312.000.

Nakayama, Mitsuru: *See*—
Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, 4,532,254, Cl. 514-456.000.

Nakayama, Toyoo: *See*—
Fujii, Setsuro; Okutome, Toshiyuki; Nakayama, Toyoo; Yaegashi, Takashi; and Kurumi, Masateru, 4,532,255, Cl. 514-466.000.

Nakayama, Yasunobu; Kunii, Takeshi; and Sato, Yasuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Telephone apparatus capable of inputting character data. 4,532,378, Cl. 179-2.0DP.

Nalco Chemical Company: *See*—
Dubin, Leonard, 4,532,047, Cl. 210-698.000.
Roe, William J.; and Perisho, Jacqueline L., 4,532,049, Cl. 210-728.000.

Nam, Chul W. Power magnification apparatus of a internal and external engine. 4,531,480, Cl. 123-19.000.

Namba Press Works Co., Ltd.: *See*—
Hashimoto, Yuji, 4,531,779, Cl. 297-284.000.

Naruse, Akisuke: *See*—
Kajiyama, Shigeru; Takaku, Kazuo; Naruse, Akisuke; and Akasu, Akira, 4,531,663, Cl. 228-29.000.

Nasman, Lars E.; and Lindstrom, Alf I., to Sunds Defibrator Aktiebolag. Apparatus for pumping of pulp. 4,531,892, Cl. 417-205.000.

Nath, Prem; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Barrier layer for photovoltaic devices. 4,532,372, Cl. 136-256.000.

National Industries, Inc.: *See*—
Kitchens, Roy A.; and DeGroff, Charles K., 4,531,283, Cl. 29-753.000.

National Mine Service Company: *See*—
Karlovsky, Jerry, 4,531,784, Cl. 299-64.000.

National Research Development Corporation: *See*—
Kuznetsov, Stephen B.; and Laithwaite, Eric R., 4,532,458, Cl. 318-111.000.

National Starch and Chemical Corporation: *See*—
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,532,270, Cl. 523-176.000.

Nee, Michael A., to N.I. Industries, Inc. Projectile launcher. 4,531,445, Cl. 89-1.813.

Neece, Thomas B. Car radio and stereo protector. 4,532,162, Cl. 428-31.000.

NEI Canada Limited: *See*—
Chang, Kwangling; and Mistry, Dalpat D., 4,531,318, Cl. 40-449.000.

Neilson, James R.; and Bishop, Robert R., to Cactus Machinery Inc. Apparatus for conditioning hygroscopic plastic material. 4,531,308, Cl. 34-168.000.

Neilson, John M. S.: *See*—
Ford, Raymond T.; Brackelmanns, Norbert W.; Wheatley, Carl F., Jr.; and Neilson, John M. S., 4,532,534, Cl. 357-23.400.

Nelson, Gunner E.: *See*—
Smith, Isaac L.; and Nelson, Gunner E., 4,532,120, Cl. 423-347.000.

Nelson, Jordan R.; and Funari, Remo A., to RCA Corporation. Impact test apparatus. 4,531,401, Cl. 73-12.000.

Nemoto, Seiichiro: *See*—
Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, 4,531,762, Cl. 280-801.000.

Nemoto, Yoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling an inverter. 4,532,583, Cl. 363-96.000.

Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, to Hoechst Aktiengesellschaft. Herbicidal esters of D-1-(phenoxy-4-phenoxy)-propionic acid. 4,531,969, Cl. 71-108.000.

Nestler, Hans J.: *See*—
Rehn, Karl; and Nestler, Hans J., 4,532,346, Cl. 562-471.000.

Nestor, Charles R., to General Motors Corporation. Insulation shearing electrical terminal. 4,531,804, Cl. 339-97.00R.

Neumann, Thomas E.: *See*—
Chupp, John P.; Ku, Audrey Y.; Neumann, Thomas E.; and Nickson, Thomas E., 4,532,353, Cl. 564-442.000.

Neuroth, David H., to Harvey Hubbell Incorporated. Electrical cable for use in extreme environments. 4,532,374, Cl. 174-103.000.

Nevamar Corporation: *See*—
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,532,170, Cl. 428-143.000.

Nevel, Donald E., to Mobil Oil Corporation. Method and apparatus for ice impact testing. 4,531,400, Cl. 73-12.000.

New Japan Chemical Co., Ltd.: *See*—
Kobayashi, Toshiaki; and Yoshimura, Masafumi, 4,532,280, Cl. 524-108.000.

Newbold, Roger A., to Mattel, Inc. Record disc, turntable and method for fixing same. 4,532,622, Cl. 369-271.000.

News Log International, Inc.: *See*—
Jewer, Alan A., 4,532,616, Cl. 369-44.000.

Ng, Fook L.; and Higgs, Bruce S., to Dow Corning Corporation. Polyorganosiloxane collectors in the beneficiation of fine coal by froth flotation. 4,532,032, Cl. 209-166.000.

NGK Spark Plug Co., Ltd.: *See*—
Kanbe, Rokuro; and Kimura, Kazuo, 4,532,190, Cl. 428-627.000.
Takami, Akio; Matsuura, Toshitaka; Tanaka, Kazutoshi; and Sekiya, Toshifumi, 4,532,179, Cl. 428-335.000.

Niagara Blower Co.: *See*—
Kals, Walter, 4,531,576, Cl. 165-108.000.

Niagara Mohawk Power Corporation: *See*—
Peterson, Robert L., 4,532,028, Cl. 208-262.000.

Nicco Machine Tool Company Ltd.: *See*—
Kuromatsu, Akio, 4,532,019, Cl. 204-129.460.

Nickerson, Leslie F., to Albany International. Forming board elements. 4,532,009, Cl. 162-351.000.

Nickolson, Robert; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; and Haberey, Martin, to Schering Aktiengesellschaft. Certain prostacyclins and their blood-pressure-lowering and thrombocyte-aggregation-inhibiting compositions and methods. 4,532,236, Cl. 514-184.000.

Nickson, Thomas E.: *See*—
Chupp, John P.; Ku, Audrey Y.; Neumann, Thomas E.; and Nickson, Thomas E., 4,532,353, Cl. 564-442.000.

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Nippon Cable System, Inc.: *See*—
Teraura, Makoto; and Baba, Masanao, 4,531,921, Cl. 440-53.000.

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Iijima, Kenzaburo, 4,531,990, Cl. 156-60.000.
Kaneko, Yasutoshi; and Yamashita, Hideo, 4,531,442, Cl. 84-195.000.

Nippon Infrared Industries Co., Ltd.: *See*—
Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,532,400, Cl. 219-121.0LS.

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Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Saito, Mikio; and Futatsuya, Fumio, 4,531,964, Cl. 71-92.000.

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Konno, Kunio; Tanaka, Masashi; and Ohki, Hiroshi, 4,531,815, Cl. 350-475.000.

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Oota, Tadashi; and Kawamura, Koichiro, 4,532,558, Cl. 360-35.100.
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Miura, Takeshi, 4,531,747, Cl. 277-134.000.

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Ueda, Akiyoshi; Nagasaki, Humiko; Takakura, Yutaka; and Kojima, Shigeru, 4,532,363, Cl. 568-424.000.

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Sakai, Tetsushi; Kobayasi, Yoshizi; Yamauchi, Hironori; and Arita, Yoshinobu, 4,531,282, Cl. 29-578.000.
Shibayama, Akinori; Fujinami, Minpai; and Yoda, Haruo, 4,532,598, Cl. 364-491.000.

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Mizuno, Yoshikazu; and Ikuma, Akira, 4,532,432, Cl. 307-10.00R.

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Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.
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Tajiri, Tadaaki; and Nishizawa, Hitoshi, 4,532,118, Cl. 423-226.000.
Nissan Motor Co., Ltd.: *See*—
Aono, Shigeo, 4,531,399, Cl. 73-4.00R.
Hiraiwa, Kazuyoshi; and Kawaguchi, Akio, 4,531,424, Cl. 74-477.000.
Hosaka, Akio; Yamamoto, Akito; and Oshiage, Katsunori, 4,532,594, Cl. 364-431.110.
Ideta, Yasufumi, 4,531,624, Cl. 192-0.094.
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Iijima, Yoshitaka, 4,531,426, Cl. 74-498.000.
Iiyama, Akihiro; Miyazaki, Hiroaki; Etoh, Yukihiro; and Tanaka, Toshiaki, 4,531,491, Cl. 123-357.000.
Kawamura, Yoshihisa; and Tanaka, Toshiaki, 4,531,488, Cl. 123-300.000.
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,531,484, Cl. 123-192.00R.
Kobayashi, Hiroshi, 4,531,407, Cl. 73-304.00C.
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,532,648, Cl. 381-41.000.
Suga, Masaaki, 4,531,433, Cl. 74-869.000.
Takahashi, Kohtei, 4,531,425, Cl. 74-477.000.
Nitchman, Harold L., and Cunningham, William B., Jr. System, apparatus and method of dispensing a liquid from disposable container and a container therefor. 4,531,656, Cl. 222-131.000.
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Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, 4,532,105, Cl. 420-451.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Shibagaki, Kazuyoshi; Mori, Yoshihisa; and Moriuchi, Takahiko, 4,532,186, Cl. 428-457.000.
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Raabe, Thomas; Bohn, Helmut; Martorana, Piero A.; and Nitz, Rolf-Eberhard, 4,532,239, Cl. 514-247.000.
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Larronde, Michael L.; and Hoos, Robert G., 4,531,579, Cl. 166-66.000.
Murphy, Robert J., Jr., 4,531,952, Cl. 55-36.000.
Noe, William J.: *See*—
Cotton, Curran D.; Ellingson, David I.; Noe, William J.; and Wilson, James D., 4,531,387, Cl. 68-3.00R.
Nogami, Akira: *See*—
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Nogami, Taro, to Hitachi, Ltd. Fluorimeter. 4,531,834, Cl. 356-73.000.
Noguchi, Hiroyuki: *See*—
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Noguchi, Yoshiki: *See*—
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, 4,531,949, Cl. 48-202.000.
Nokami, Junzo: *See*—
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Golino, Carlo M.; Lachman, Irwin M.; and Nordlie, Lawrence A., 4,532,228, Cl. 502-261.000.
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Rosenbaum, Stanley D.; and Holy, Zdenek, 4,532,381, Cl. 179-18.0FA.
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MacDonald, Robert C., 4,532,089, Cl. 264-4.300.
Norton, William J.; and Wolosky, Irwin S., to C. R. Bard, Inc. Helical ureteral stent. 4,531,933, Cl. 604-8.000.
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Kniazzeh, Alfredo G.; Mailloux, Dennis R.; and Norvaisa, Kestutis, 4,532,193, Cl. 429-82.000.
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Nyquist, Jack K.: *See*—
Chao, Tze; and Nyquist, Jack K., 4,532,113, Cl. 423-138.000.
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Ricketts, Thomas E., 4,531,783, Cl. 299-2.000.
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Seelen, Franciscus J. H. M., 4,531,725, Cl. 271-186.000.
Odell, Barbara, to Shell Oil Company. Process for the dissolution of peptides in non-aqueous and mixed non-aqueous/aqueous systems. 4,532,212, Cl. 435-197.000.
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., to Nevamar Corporation. Scuff-resistant laminates. 4,532,170, Cl. 428-143.000.
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Boulay, Jean-Louis; Larigaldie, Serge; and Reibaud, Jean-Louis, 4,531,691, Cl. 244-1.00A.
Ogata, Yohji; Aida, Isao; Murayama, Hirokazu; and Shibuya, Kenjiro, to Kabushiki Kaisha Kobe Seiko Sho. Method for gas shielded arc welding with direct current non-consumable electrode. 4,532,409, Cl. 219-137.00R.
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Saito, Tadao; and Ogawa, Riichi, 4,531,657, Cl. 222-108.000.
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Yamaguchi, Keiki; Ogawa, Tadashi; Mitamura, Masayoshi; and Shimizu, Tooru, 4,532,644, Cl. 378-16.000.
Ogle, James A.: *See*—
Holz, George E.; and Ogle, James A., 4,532,505, Cl. 340-775.000.
Ogoe, Samuel A., to Dow Chemical Company, The. Carbonate polymer composition. 4,532,284, Cl. 524-169.000.
Oguino, Masanori, to Hitachi, Ltd. Rear projection screen. 4,531,812, Cl. 350-128.000.
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Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, 4,532,561, Cl. 360-73.000.
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Oheda, Hidetoshi: *See*—
Matsuura, Hideharu; Tanaka, Kazunobu; Matsuda, Akihisa; Okushi, Hideyo; Oheda, Hidetoshi; Yamasaki, Satoshi; and Hata, Nobuhiro, 4,532,373, Cl. 136-258.000.
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Richardson, Richard W., 4,532,408, Cl. 219-130.010.
Ohira, Tsuyoshi: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Ohira, Tsuyoshi, 4,532,613, Cl. 365-230.000.
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Kurata, Masami; and Ohmori, Takashi, 4,532,551, Cl. 358-293.000.
Ohno, Tadayoshi: *See*—
Yana, Masasumi; and Ohno, Tadayoshi, 4,532,524, Cl. 346-76.0PH.
Ohta, George: *See*—
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.

Ohta, Kazuhiro: *See*—
Miura, Tatsuo; Ohta, Kazuhiro; Hasegawa, Yoshiharu; and Yoneyama, Takao, 4,531,980, Cl. 148-11.5OC.

Ohta, Norio; Ando, Keikichi; Hosoe, Yuzuru; Sugita, Yutaka; and Ishida, Fumihiko, to Hitachi, Ltd. Garnet film for ion-implanted magnetic bubble device. 4,532,180, Cl. 428-336.000.

Ohtomo, Fumio, to Tokyo Kogaku Kikai Kabushiki Kaisha. Optical range finder. 4,531,833, Cl. 356-5.000.

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Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,531,284, Cl. 29-784.000.

Oikawa, Tadahisa: *See*—
Kondo, Kouichi; and Oikawa, Tadahisa, 4,531,851, Cl. 400-583.300.

Oinoue, Kenichi, to Olympus Optical Company Limited. Method for detecting F-number of lens. 4,531,835, Cl. 356-124.000.

Okabe, Masao: *See*—
Sugio, Akitoshi; and Okabe, Masao, 4,532,306, Cl. 525-397.000.

Okamoto, Tetuo: *See*—
Sugiura, Sabro; Fujita, Senji; Kanada, Kenji; Demukai, Noboru; and Okamoto, Tetuo, 4,531,971, Cl. 75-13.000.

Okamoto, Yukio: *See*—
Miwa, Tadashi; Kimura, Kiyoshi; Okamoto, Yukio; and Tarumi, Noriyoshi, 4,531,825, Cl. 355-3.0TR.

Okamura Corp.: *See*—
Iemura, Takusuke; Goto, Takeshi; and Komaki, Hiroshi, 4,531,789, Cl. 312-268.000.

Okamura, Terumasa: *See*—
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.

Okasaka, Kenichi: *See*—
Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, 4,531,647, Cl. 212-147.000.

Okazaki, Yutaka: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Okoh, Tomio; Matsumoto, Tomoaki; and Hirokawa, Noboru, to Kabushiki Kaisha Fujikoshi. Variable output vane pump. 4,531,893, Cl. 417-220.000.

Okorley, Jonathan A.: *See*—
Humphreys, Paula L.; and Okorley, Jonathan A., 4,532,111, Cl. 423-22.000.

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Okuda, Jun; Miwa, Ichitomo; Inagaki, Kazuhiro; Horie, Tokunaru; and Nakayama, Mitsuru, to Kaken Pharmaceutical Co., Ltd. Inhibitor of aldose reductase. 4,532,254, Cl. 514-456.000.

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Okushi, Hideyo: *See*—
Matsuura, Hideharu; Tanaka, Kazunobu; Matsuda, Akihisa; Okushi, Hideyo; Oheda, Hidetoshi; Yamasaki, Satoshi; and Hata, Nobuhiro, 4,532,373, Cl. 136-258.000.

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Olin Corporation: *See*—
Butt, Sheldon H., 4,532,222, Cl. 501-32.000.
Polan, Ned W.; Smialek, Raymond J.; Parthasarathi, Arvind; and Sevier, Peter E., 4,532,014, Cl. 204-28.000.
Wright, David B.; Ralston, Richard W., Jr.; and Ford, James M., 4,532,018, Cl. 204-98.000.

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Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,532,526, Cl. 346-107.00R.
Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,532,527, Cl. 346-108.000.

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Donatt, Norman L., 4,531,338, Cl. 52-235.000.

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O'Malley, Michael P.; Henderson, David E.; Cable, Mark J.; and Hefferon, James E., to International Packaging Systems Inc. Method and apparatus for the manufacture of molded packings. 4,532,093, Cl. 264-40.100.

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Koizumi, Haruyuki; Kitao, Zenichi; and Sato, Hideki, 4,532,393, Cl. 200-159.00R.
Yamashita, Tsukasa; Mori, Kazuhiko; Matano, Masaharu; and Ota, Norihiro, 4,532,632, Cl. 372-50.000.

Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, to Kuraray Co., Ltd. Certain cyclopropane carboxylic acid esters and their pesticidal use. 4,532,258, Cl. 514-471.000.

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Oota, Tadashi; and Kawamura, Koichiro, to Nippon Kogaku K.K. Picture recording apparatus. 4,532,558, Cl. 360-35.100.

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Toriyabe, Tetsuo; Ooya, Kunihiko; Nogami, Akira; and Sugawara, Kazunori, 4,531,626, Cl. 198-347.000.

Orlita, Franz. Piston pump with a rotating piston. 4,531,897, Cl. 417-500.000.

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Osborne, Edward L., to Westvaco Corporation. Interlock between telescoping cover and tray. 4,531,669, Cl. 229-45.00R.

Oshiage, Katsunori: *See*—
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Oshitani, Akiyoshi; and Katsumata, Akira, to Kel Corporation. IC Connector. 4,531,792, Cl. 339-17.0CF.

Osterholm, Jewell L., to Thomas Jefferson University. Method and apparatus for tomographic diagnosis. 4,532,591, Cl. 364-414.000.

Ostertag, Klaus: *See*—
Ross, Dieter; and Ostertag, Klaus, 4,532,430, Cl. 250-572.000.

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Smith, Richard T.; and Osthues, Robert H., 4,531,273, Cl. 29-157.10R.

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Yamashita, Tsukasa; Mori, Kazuhiko; Matano, Masaharu; and Ota, Norihiro, 4,532,632, Cl. 372-50.000.

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Yamato, Akihiro; and Otobe, Yutaka, 4,531,495, Cl. 123-479.000.

Otrhalek, Joseph V.; and Gerard, Donald R., to Detrex Chemical Industries, Inc. Method of forming chromate conversion coatings on aluminum surfaces and the coating formed thereby. 4,531,978, Cl. 148-6.160.

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Takao, Hisashi, 4,532,339, Cl. 549-470.000.
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shirai, Takashi; and Saito, Norio, 4,532,077, Cl. 260-245.400.

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Knable, Thomas; Sollner, Lydia; Wethey, Richard; and Otte, Ilse, 4,532,276, Cl. 524-18.000.

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Blackburn, Arthur M., 4,532,488, Cl. 337-111.000.

Oury, Robert F.; and Arndt, Charles J., to Rotec Industries, Inc. Load sensor. 4,531,630, Cl. 198-505.000.

Overbeck, James W., to XRL, Inc. Method and apparatus for positioning a focused beam on an integrated circuit. 4,532,402, Cl. 219-121.0LU.

Overkott, Franz, to Paul Ferd. Peddinghaus, Firma. Method of deep hardening of workpieces. 4,531,983, Cl. 148-16.000.

Overton, David E.: *See*—
Liu, Ping Y.; and Overton, David E., 4,532,282, Cl. 524-157.000.

Owens-Corning Fiberglas Corporation: *See*—
Schuster, Gary B. A., 4,532,184, Cl. 428-433.000.

Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, to Hitachi, Ltd. Solid-state imaging device with high quasi-signal sweep-out efficiency and high signal charge transfer efficiency. 4,532,549, Cl. 358-213.000.

Paau, Alan: *See*—
Yang, Ning-Sun; and Paau, Alan, 4,531,324, Cl. 47-81.000.

Pacesetter Systems, Inc.: *See*—
Yates, Roy A., 4,531,937, Cl. 604-53.000.

Pack, Gary D.: *See*—
Shackle, Dale R.; Cousin, Michael J.; and Pack, Gary D., 4,532,183, Cl. 428-402.220.

Padget, John C.: *See*—
Caldwell, David; Miller, David; and Padget, John C., 4,532,159, Cl. 427-388.400.

Padron, Tamara; and Lopez, Ignacio, to Lever Brothers Company. Liquid detergent compositions containing hydroxypropyl methylcellulose. 4,532,067, Cl. 252-174.170.

Paeye, Gerard F., to Jeumont-Schneider Corporation. Solar-powered refrigeration unit. 4,531,384, Cl. 62-477.000.

Pagdin, Brian C., to Solex (U.K.) Limited. Electromagnetically-operable fluid injection. 4,531,679, Cl. 239-585.000.

Pahl, Ingo H.: *See*—
Ziemek, Gerhard; and Pahl, Ingo H., 4,531,991, Cl. 156-79.000.

Pair, Louis C., to Walker, Joe H. Antikickback hold-down safety device for table saws. 4,531,438, Cl. 83-156.000.

Pako Corporation: *See*—
Henk, Keith L., 4,532,500, Cl. 340-675.000.

Pallos, Ferenc M.; DeBaun, Jack R.; and Teach, Eugene G., to Stauffer Chemical Company. 1-(Substituted phenylthiocarbamyl) 3,3-disubstituted formamidines and their use as pharmaceutical agents. 4,532,348, Cl. 564-27.000.

Palmer, George J., to Turbo Ventana Limited. Ventilators. 4,531,455, Cl. 98-96.000.

Pamer, Karl A., to Litton Systems, Inc. Material handling system. 4,531,460, Cl. 105-150.000.

Pamer, Steven E.; and Cook, James A., Jr., to PPG Industries, Inc. Process for producing 2-halomethyl-1,3-cyclic acetal. 4,532,338, Cl. 549-455.000.

Pander, Hans J.: *See*—
Toussaint, Herbert; and Pander, Hans J., 4,532,082, Cl. 260-465.100.

Pandolfi, Maurizio: *See*—
Comi, Gaetano; and Pandolfi, Maurizio, 4,532,129, Cl. 424-94.000.

Panetti, Romolo, to Speno International S.A. Method for measuring the transverse profile of the head of a rail of a railroad track. 4,531,837, Cl. 356-376.000.

Pappas, George; and Perdios, Archimedes M. Mop holder. 4,531,251, Cl. 15-147.00R.

Pappas, Phillip M. Fail safe high limit control. 4,532,490, Cl. 337-320.000.

Paques, Gerardus H. F., to Multinorm B.V. Silage distributor movable by means of a vehicle. 4,531,880, Cl. 414-473.000.

Paradyne Corporation: *See—*
Bremer, Gordon; Betts, William; and Martinez, Kenneth, 4,532,640, Cl. 375-120.000.

Paramount Glass Mfg., Co., Ltd.: *See—*
Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, 4,532,105, Cl. 420-451.000.

Parent, Christopher A.; and Ferry, William R., to United Innovations div. of United Engineers, Inc. Calendar. 4,531,314, Cl. 40-119.000.

Park, Chung P.; and Suh, Kyung W., to Dow Chemical Company, The. Alkenyl aromatic monomer olefinically unsaturated acid foams and method for the preparation thereof. 4,532,265, Cl. 521-147.000.

Park, Joonmin: *See—*
Daniels, Vernon A.; Park, Joonmin; and Ivanyi, Steven, 4,532,097, Cl. 264-258.000.

Park-Ohio Industries, Inc.: *See—*
Pfaffmann, George D.; and Mucha, George M., 4,531,987, Cl. 148-150.000.

Parker Chemical Company: *See—*
Lindert, Andreas, 4,532,309, Cl. 525-488.000.

Parker, Donald L.: *See—*
Warwick, Edward H.; and Parker, Donald L., 4,531,276, Cl. 29-417.000.

Parma Corporation: *See—*
Rogers, Walter C., Jr., 4,531,778, Cl. 297-85.000.

Parman, David G.: *See—*
Weitzel, Harold B.; and Parman, David G., 4,532,375, Cl. 174-107.000.

Parr, Ted K.: *See—*
Forte, Thomas E.; and Parr, Ted K., 4,531,517, Cl. 128-92.0EC.

Parthasarathi, Arvind: *See—*
Polan, Ned W.; Smialek, Raymond J.; Parthasarathi, Arvind; and Sevier, Peter E., 4,532,014, Cl. 204-28.000.

Passien, Ray. Apparatus for cleaning carpet. 4,531,257, Cl. 15-321.000.

Pasternak, Eliezer, to Joytronix, Inc. Foodstuffs imaging process and apparatus. 4,531,292, Cl. 33-18.00R.

Pastor, Antonio C.: *See—*
Harrington, James A.; Pastor, Antonio C.; Standlee, Arlie G.; and Turk, Roger R., 4,532,000, Cl. 156-620.000.

Paszek, Leon E.; and Bernarducci, Ernest, to Sterling Drug Inc. Stable mildly acidic aqueous polishing cleanser and preparation thereof. 4,532,066, Cl. 252-144.000.

Patell, Thomas W.: *See—*
Creagan, Richard W.; and Patell, Thomas W., 4,532,008, Cl. 162-203.000.

Paton, H. Neil. Railway car draft gear with slack adjustment and cushioning. 4,531,648, Cl. 213-50.000.

Patton, Jerry R., to Mallinckrodt, Inc. Separation of aniline and p-fluoroaniline. 4,532,352, Cl. 564-438.000.

Patzelt, Helmut, to Daimler-Benz Aktiengesellschaft. Power steering for motor vehicles. 4,531,760, Cl. 280-777.000.

Paul Ferd. Peddinghaus, Firma: *See—*
Overkott, Franz, 4,531,983, Cl. 148-16.000.

Paul, William A. Mooring line coupler. 4,531,470, Cl. 114-230.000.

Paulus, Wilfried: *See—*
Ritter, Helmut; Paulus, Wilfried; and Genth, Hermann, 4,532,259, Cl. 514-608.000.

Payen International Limited: *See—*
Herrington, Maurice G., 4,531,750, Cl. 277-235.00B.

Payne, Frederick A., to University of Kentucky Research Foundation. Biomass gasifier combustor. 4,531,462, Cl. 110-210.000.

Pearce, Euan I. F., to Development Finance Corporation of New Zealand. Dental rinse. 4,532,124, Cl. 424-52.000.

Pennebaker, William B., to International Business Machines Corporation. Sequence controlled pixel configuration. 4,532,503, Cl. 340-728.000.

Pennebaker, William B., Jr.; and Pennington, Keith S., to International Business Machines Corporation. Data filter and compression apparatus and method. 4,532,651, Cl. 382-54.000.

Pennington, Keith S.: *See—*
Pennebaker, William B., Jr.; and Pennington, Keith S., 4,532,651, Cl. 382-54.000.

Pennwalt Corporation: *See—*
Holland, Hugh R.; and Adamo, Rosario, 4,531,673, Cl. 239-113.000.

Peppers, James M. Wall bore electrical generator. 4,532,614, Cl. 367-81.000.

Perdios, Archimedes M.: *See—*
Pappas, George; and Perdios, Archimedes M., 4,531,251, Cl. 15-147.00R.

Perisho, Jacqueline L.: *See—*
Roe, William J.; and Perisho, Jacqueline L., 4,532,049, Cl. 210-728.000.

Perkin-Elmer Corporation, The: *See—*
Matthews, David J., 4,532,628, Cl. 371-13.000.

Perkins, Kenneth R. Roller skate wheel and mounting assembly. 4,531,785, Cl. 301-5.700.

Pernovo AB: *See—*
Larsson, Per-Olof; Mosbach, Klaus; and Borchert, Axel, 4,532,232, Cl. 502-403.000.

Peroutky, Donald C.: *See—*
Corby, Nelson R., Jr.; Lund, Richard M.; and Peroutky, Donald C., 4,532,405, Cl. 219-124.340.

Perrin, Patrice: *See—*
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,532,315, Cl. 528-14.000.

Perroud, Anne-Marie: *See—*
Cornu, Aime ; and Perroud, Anne-Marie, 4,532,073, Cl. 252-492.000.

Persson, Louis T.; and Riemersma, Coenraad E., to Procter & Gamble Company, The. Dynamic laminating method and apparatus for ultrasonically bonding juxtaposed webs. 4,531,999, Cl. 156-580.200.

Peters, Loren W.; and Turner, Reed J., to Deere & Company. Cleaning shoe for a combine. 4,531,528, Cl. 130-24.000.

Petersen, Christian C., to Polaroid Corporation. Electromagnetic actuator generating equal and opposing force vectors. 4,531,820, Cl. 354-234.100.

Peterson, David A., to Cincinnati Milacron Inc. Adjustable tape chute for tape laying machine. 4,531,998, Cl. 156-574.000.

Peterson, Elmer R., to Baker Oil Tools, Inc. Fluid pressure actuated perforating gun. 4,531,590, Cl. 175-4.520.

Peterson, Robert L., to Niagara Mohawk Power Corporation. Method for reducing content of halogenated aromatics in hydrocarbon solutions. 4,532,028, Cl. 208-262.000.

Pettipas, Albert G.: *See—*
Pettipas, John A.; and Pettipas, Albert G., 4,531,744, Cl. 273-275.000.

Pettipas, John A.; and Pettipas, Albert G. Open house - game. 4,531,744, Cl. 273-275.000.

Pfaffmann, George D.; and Mucha, George M., to Park-Ohio Industries, Inc. Method for inductively heat treating workpiece bore walls. 4,531,987, Cl. 148-150.000.

Phelps, Andrew E., to Burroughs Corporation. Content addressable memory cell with shift capability. 4,532,606, Cl. 365-49.000.

Phelps, Craig H.; and Sampath, Krishnaswamy, to Mobil Oil Corporation. Flow cell assembly. 4,531,404, Cl. 73-38.000.

Phillips, Brian T.: *See—*
Hartman, George D.; and Phillips, Brian T., 4,532,237, Cl. 514-226.000.

Phillips, David A. Hinged vehicle gate arm. 4,531,325, Cl. 49-49.000.

Phillips, John P., to Dubilier PLC. Fuses, particularly subminiature cartridge fuses, and a method of manufacture thereof. 4,532,489, Cl. 337-228.000.

Phillips Petroleum Company: *See—*
Boultinghouse, Harold D.; Boeke, Paul J.; Benefield, Robert E., Jr.; and Leland, John, 4,532,015, Cl. 204-38.400.
Drake, Charles A.; 4,532,360, Cl. 568-357.000.
Fontenot, Delouis J., 4,531,549, Cl. 137-864.000.
Hawley, Gil R., 4,532,312, Cl. 526-119.000.
Kukes, Simon G.; and Shioyama, Tod K., 4,532,362, Cl. 568-401.000.
Layton, James E., 4,532,434, Cl. 307-261.000.
Wilt, Mason S.; and Dietz, Richard E., 4,532,272, Cl. 523-330.000.

Phillips, William E. Bed/shelter unit. 4,531,330, Cl. 52-2.000.

Pickens, Joseph R., to Inco Alloys International, Inc. Mechanically alloyed dispersion strengthened aluminum-lithium alloy. 4,532,106, Cl. 420-528.000.

Pickup, John G.: *See—*
Saleeb, Fouad Z.; and Pickup, John G., 4,532,145, Cl. 426-650.000.

Pierburg GmbH & Co KG: *See—*
Sudbeck, Rainer; Baumgartner, Hans; and Brandstadter, Manfred, 4,531,899, Cl. 418-59.000.

Pierre, Gibert. Stabilized load handling vehicle with orientable arm. 4,531,882, Cl. 414-687.000.

Pike, Martin M.: *See—*
Springer, Charles S., Jr.; Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., 4,532,217, Cl. 436-79.000.

Pilat, John F.: *See—*
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Pinson, George T., to Boeing Company, The. Active vibration isolator. 4,531,699, Cl. 248-550.000.

Pioneer Electronic Corporation: *See—*
Noguchi, Tadashi, 4,532,482, Cl. 330-307.000.

Piper Industries, Inc.: *See—*
Sousek, Eugene A., 4,531,351, Cl. 56-98.000.

Pitre, John H., to Questar. Weight lifting exercise device. 4,531,727, Cl. 272-117.000.

Plastofilm Industries, Inc.: *See—*
Cusmano, James A., 4,531,637, Cl. 206-461.000.

Platzker, Aryeh: *See—*
Tajima, Yusuke; and Platzker, Aryeh, 4,532,484, Cl. 333-116.000.

Plesa, Laszlo , to "Aranykalasz" Mgtsz. Cutting tool for manual grafting. 4,531,290. Cl. 30-178.000.

Pleschiutschnigg, Fritz-Peter: *See—*
Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Diederich, Gerd, 4,531,567, Cl. 164-415.000.

Plessey Overseas Limited: *See—*
Hislop, Thomas H., 4,532,520, Cl. 343-373.000.

Pliml, Frank V., Jr., to Illinois Tool Works Inc. Two-position rotary switch assembly. 4,532,387, Cl. 200-11.00R.

Plummer, William T., to Polaroid Corporation. Injection mold for forming optical fiber connector. 4,531,702, Cl. 249-64.000.

Pluss, Raymond, to Sulzer Brothers Limited. Packing made of one-piece layers. 4,532,086, Cl. 261-94.000.

Pohl, Stanley: *See—*
Feinland, Raymond; Pohl, Stanley; and Hnatchenko, Michael, 4,532,127, Cl. 424-62.000.

Polan, Ned W.; Smialek, Raymond J.; Parthasarathi, Arvind; and Sevier, Peter E., to Olin Corporation. Laser alignment system. 4,532,014, Cl. 204-28.000.

Polaroid Corporation: *See—*
Hicks, John W., Jr., 4,531,811, Cl. 350-96.330.
Kniazzeh, Alfredo G.; Mailloux, Dennis R.; and Norvaisa, Kestutis, 4,532,193, Cl. 429-82.000.
Mills, Loring K., 4,531,684, Cl. 242-71.100.
Petersen, Christian C., 4,531,820, Cl. 354-234.100.
Plummer, William T., 4,531,702, Cl. 249-64.000.
Shenk, Edwin K., 4,531,822, Cl. 354-401.000.

Polaroid Corporation, Patent Dept.: *See—*
Shulman, Joseph, 4,531,765, Cl. 283-114.000.

Polinski, Leonard R., Jr., to Babcock & Wilcox Company, The. Constant current source for field contact input. 4,532,466, Cl. 323-311.000.

Poll, Robert F.: *See—*
Labib, Mohamed E.; Wang, Chin-Chun; and Poll, Robert F., 4,532,074, Cl. 252-511.000.

Polytel Corp.: *See—*
Danish, Sherif, 4,532,497, Cl. 340-365.00S.

Pommer, Ernst-Heinrich: *See—*
Buschmann, Ernst; Schulz, Guenter; Heilen, Gerd; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,532,234, Cl. 514-63.000.

Pommer, Karl E., II, to GTE Automatic Electric Incorporated. Power supply for telephone equipment memory devices. 4,532,382, Cl. 179-81.00R.

Poole, Forrest R.; and Hansen, David G., to David Clark Company Incorporated. Transparent pressure garment. 4,531,516, Cl. 128-89.00R.

Povlick, Thomas P.; and Lund, Richard M., to General Electric Company. Arc welding torch having integrated wire feed. 4,532,406, Cl. 219-124.340.

Powell, Richard G.; and Smith, Cecil R., Jr., to United States of America, Agriculture. Sesbanimide and the use thereof in treating leukemic tumors. 4,532,327, Cl. 546-214.000.

Powell, Steven H., to Iomega Corporation. Servo control of seek operation in magnetic disk drive. 4,532,562, Cl. 360-78.000.

Power Technology Partners, Ltd.: *See—*
Freeny, Charles C., Jr., 4,532,582, Cl. 363-90.000.

PPG Industries, Inc.: *See—*
Carley, Earl P., 4,532,169, Cl. 428-109.000.
Pamer, Steven E.; and Cook, James A., Jr., 4,532,338, Cl. 549-455.000.
Rinehart, Jay K., 4,531,970, Cl. 71-118.000.

Pratt, Robert G.: *See—*
Meese, William G.; Pratt, Robert G.; Charneski, Mitchell D.; Brokenshire, Robert E.; and Whitney, Bruce F., 4,532,418, Cl. 235-381.000.

Pratt, Rodger. Crimping tool. 4,531,397, Cl. 72-451.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nach. GmbH & Co.: *See—*
Hochgesang, Gerhard, 4,531,793, Cl. 339-17.00F.

Price, Robert; and Kurth, Richard R., to Sperry Corporation. CFAR receiver apparatus for detecting a signal in noise. 4,532,639, Cl. 375-96.000.

Prime Computer, Inc.: *See—*
Long, Charles C.; Lounsbury, David M.; and Curtin, Richard R., 4,532,559, Cl. 360-51.000.

Pringle, Ronald E.; and Morris, Arthur J., to Camco, Incorporated. Piston actuated high temperature well packer. 4,531,581, Cl. 166-120.000.

Procter & Gamble Company, The: *See—*
Janusz, John M.; and LaHann, Thomas R., 4,532,139, Cl. 514-627.000.
Persson, Louis T.; and Riemersma, Coenraad E., 4,531,999, Cl. 156-580.200.

Produits Chimiques Ugine Kuhlmann: *See—*
Bachelard, Roland; and Lamalle, Maurice, 4,532,121, Cl. 423-600.000.

Prohaska, Hans: *See—*
Botz, Jakob; Mutschler, Erich; Prohaska, Hans; Schmid, Eckhardt; and Scholl, Wolfgang, 4,531,419, Cl. 74-388.0PS.

Prud'homme, Robert K.; Stanley, Frederick W., Jr.; and Langhorst, Martin A., to Dow Chemical Company, The. Method for characterizing the molecular weight and molecular weight distribution of ultra-high molecular weight water soluble polymers. 4,532,043, Cl. 210-635.000.

Prud'hon, Lucien; and Bele, Robert, to CGR Ultrasonic. Ultrasonic probe for accurately determining angular position and an echography apparatus using such a probe. 4,531,412, Cl. 73-621.000.

Puda, Mark E., to Aluminum Company of America. Phase compensator for gauge control using estimate of roll eccentricity. 4,531,392, Cl. 72-10.000.

Puff, Norbert M. Electronic audio-visual timepiece. 4,531,841, Cl. 368-63.000.

Pugsley, Peter C., to Crosfield Electronics Limited. Controlling register in a printing press. 4,532,596, Cl. 364-469.000.

Pulverenti, John T.; Hentz, Robert S.; and DiPaola, John J., to General Signal Corporation. Communication system having timer controlled field stations. 4,532,509, Cl. 340-825.000.

Punshon, John: *See—*
Thomas, Gerald S.; Punshon, John; and Barr, John A., 4,531,496, Cl. 123-495.000.

Purcell, Robert H.: *See—*
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,532,215, Cl. 435-237.000.

Purdue Research Foundation: *See—*
Citron, Stephen J.; and Mihelc, William P., 4,532,592, Cl. 364-431.050.

Putnam, Joe A. Container for fluids. 4,531,655, Cl. 222-105.000.

Pyromid, Inc.: *See—*
Hait, Paul W.; and Rohrer, Dan, 4,531,505, Cl. 126-9.00R.

Quaker Oats Company, The: *See—*
Sahler, John T., 4,531,736, Cl. 273-56.000.

Quenemoen, Robert D.: *See—*
Sandt, David K.; Mitlyng, Arthur V., Jr.; Ilaug, Harold W.; and Quenemoen, Robert D., 4,531,538, Cl. 137-334.000.

Questtar: *See—*
Pitre, John H., 4,531,727, Cl. 272-117.000.

Quigley, Herbert J.: *See—*
Malette, William G.; and Quigley, Herbert J., 4,532,134, Cl. 514-55.000.

Quillec, Maurice: *See—*
Benchimol, Jean-Louis; and Quillec, Maurice, 4,532,001, Cl. 156-622.000.

R. E. Phelon Company, Inc.: *See—*
Burson, Bob O., 4,531,500, Cl. 123-630.000.

R. Englehardt Nominees Pty. Ltd.: *See—*
Engelhardt, David R., 4,531,947, Cl. 8-495.000.

R. J. Reynolds Tobacco Company: *See—*
White, Jackie L.; and Conrad, Lucas J., 4,531,529, Cl. 131-291.000.

R. P. Scherer Corporation: *See—*
Ebert, William R.; Hom, Foo S.; and Kindt, Warren W., 4,532,126, Cl. 424-48.000.

Raabe, Thomas; Bohn, Helmut; Martorana, Piero A.; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. N-phenoxypropanol-N'-pyridazinyl ethylendiamines as β-receptor blockers. 4,532,239, Cl. 514-247.000.

Rabatin, Jacob G., to General Electric Company. Process for the preparation of rare earth oxyhalide phosphor. 4,532,070, Cl. 252-301.40H.

Racich, John J., to G Q Games, Inc. Portable desk. 4,531,642, Cl. 211-42.000.

Radler, Richard W.: *See—*
Thomsen, Karl V.; and Radler, Richard W., 4,532,166, Cl. 428-57.000.

Raj, Kuldip, to Ferrofluidics Corporation. Compact ferrofluid seal and bearing assembly. 4,531,846, Cl. 384-478.000.

Rajnik, Lawrence S.: *See—*
Johnson, Ronald E.; Rajnik, Lawrence S.; and Wu, Lung-ming, 4,532,175, Cl. 428-220.000.

Ralston, Richard W., Jr.: *See—*
Wright, David B.; Ralston, Richard W., Jr.; and Ford, James M., 4,532,018, Cl. 204-98.000.

Rance, William G., Jr.: *See—*
Beach, Laurence R., Jr.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,531,689, Cl. 242-195.000.

Ranken, Paul F., to Ethyl Corporation. Decarboxylation process for preparing 4-(3-aminophenyl)pyridines. 4,532,326, Cl. 546-156.000.

Rasshofer, Werner; Balle, Gerhard; Dieterich, Dieter; and Meyborg, Holger, to Bayer Aktiengesellschaft. Polymer-containing polyether polyamines and a process for the production of these polyamines. 4,532,266, Cl. 521-159.000.

Rasshofer, Werner, to Bayer Aktiengesellschaft. Aromatic polyamines containing primary aromatic amino groups, urethane groups and polyester groups, and a process for the production thereof. 4,532,317, Cl. 528-60.000.

Ratka, Frances I.: *See—*
Suresh, Dev D.; Grasselli, Robert K.; Brazdil, James F.; and Ratka, Frances I., 4,532,083, Cl. 260-465.300.

Rau, Karl; and Haub, Martin, to VDO Adolf Schindling AG. Liquid-level transmitter with bell jar housing for gasoline tanks. 4,532,491, Cl. 338-33.000.

Rauben Heimer, Hans-Juergen: *See—*
Denzinger, Walter; Hartmann, Heinrich; Faulhaber, Gerhard; and Rauben Heimer, Hans-Juergen, 4,532,320, Cl. 528-498.000.

Ray-Chaudhuri, Dilip K.: *See—*
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,532,270, Cl. 523-176.000.

Rayburn, Charles C., to Illinois Tool Works Inc. Method of making capacitive structures. 4,531,268, Cl. 29-25.420.

Raychem Corporation: *See—*
Claunch, Carney P., II; Kridl, Thomas A.; and Gamarra, Jose P., 4,532,164, Cl. 428-36.000.

Raynaud, Jacques; Darmois, Jean; Jolivet, Pierre; and Guillot, Jean, to Societe Nationale Industrielle et Aerospatiale. System for piloting a missile by means of lateral gaseous jets and missile comprising such a system. 4,531,693, Cl. 244-52.000.

Raytheon Company: *See—*
Gray, George G., 4,531,799, Cl. 339-75.00M.
Simon, James F., 4,531,468, Cl. 114-21.00A.
Tajima, Yusuke; and Platzker, Aryeh, 4,532,484, Cl. 333-116.000.

RCA Corporation: *See—*
Basile, Philip C., 4,532,433, Cl. 307-241.000.
Bendell, Sidney L.; and Johnson, Cydney A., 4,532,550, Cl. 358-213.000.

Bismarck, Otto H., 4,532,436, Cl. 307-279.000.
Coyle, Peter J., 4,532,623, Cl. 369-271.000.
Ford, Raymond T.; Brackelmanns, Norbert W.; Wheatley, Carl F., Jr.; and Neilson, John M. S., 4,532,534, Cl. 357-23.400.
Gange, Robert A., 4,532,452, Cl. 313-346.00R.
Haferl, Peter E., 4,532,457, Cl. 315-411.000.
Hanak, Joseph J.; and Nostrand, Gerald E., 4,532,371, Cl. 136-249.000.
Kane, James, 4,532,537, Cl. 357-30.000.
Labib, Mohamed E.; Wang, Chin-Chun; and Poll, Robert F., 4,532,074, Cl. 252-511.000.
Mangulis, Visvaldis, 4,532,635, Cl. 375-1.000.
McNeely, Michael L., 4,532,095, Cl. 264-107.000.
Nelson, Jordan R.; and Funari, Remo A., 4,531,401, Cl. 73-12.000.
White, Lawrence K., 4,532,002, Cl. 156-643.000.
Wine, Charles M., 4,532,540, Cl. 358-12.000.

RDM International, Inc.: *See*—
Mioduski, Paul, 4,531,524, Cl. 128-422.000.

Reanal Finomvegyszergyar: *See*—
Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, 4,532,214, Cl. 435-228.000.

Reber, Harald: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; and Reber, Harald, 4,532,013, Cl. 204-1.00T.

Reeds, John W., to Hughes Aircraft Company. Wafer height correction system for focused beam system. 4,532,426, Cl. 250-442.100.

Reeves, James B., Jr. Adjustable pitch sprocket. 4,531,926, Cl. 474-49.000.

Reggers, Charles G.; Cohr, Lindsay W. J.; and Liddell, Stafford A. Y. Applicator tool. 4,531,520, Cl. 128-330.000.

Rehn, Karl; and Nestler, Hans J., to Hoechst Aktiengesellschaft. Process for the preparation of hydroxyphenoxy-alkanecarboxylic acids. 4,532,346, Cl. 562-471.000.

Reibaud, Jean-Louis: *See*—
Boulay, Jean-Louis; Larigaldie, Serge; and Reibaud, Jean-Louis, 4,531,691, Cl. 244-1.00A.

Reiche, Werner, to Trutzschler GmbH & Co. KG. System for blending textile fibers. 4,531,262, Cl. 19-145.500.

Reid, John H. Flow control apparatus for aerobic sewage treatment. 4,532,038, Cl. 210-194.000.

Reif, Robert B.; and Albrechtson, Loren R., to Battelle Development Corp. Apparatus and method for measuring the concentration of large particles in a gas. 4,531,402, Cl. 73-28.000.

Reif, Robert B.; and Albrechtson, Loren R., to Battelle Development Corporation. Apparatus and method for measuring the concentration of particles in a gas. 4,531,486, Cl. 123-198.0DC.

Reimer, William A., to GTE Automatic Electric Incorporated. Printed wiring board file and method of utilizing the same. 4,532,576, Cl. 361-415.000.

Reiner, Richard A.; Siebenlist, John J.; and Clarey, Robert J., to Eaton Corporation. Electric meter center. 4,532,574, Cl. 361-365.000.

Reiner, Robert, to Siemens Aktiengesellschaft. Monolithically integrable MOS-comparator circuit. 4,532,438, Cl. 307-362.000.

Reinhold, Herbert E., Jr.; and Auerbach, Albert A., to Survival Technology, Inc. Ambulatory monitoring system with real time analysis and telephone transmission. 4,531,527, Cl. 128-696.000.

Reith, Werner, to Mannesmann Rexroth GmbH. Arrangement for controlling a hydraulic motor. 4,531,449, Cl. 91-420.000.

Reliance Electric Company: *See*—
Heshmat, Hooshang, 4,531,845, Cl. 384-406.000.

Renard, Michel, to Moteurs Leroy-Somers. Electrotechnical device for regulating asynchronous rotating machines. 4,532,465, Cl. 318-814.000.

Renault Vehicules Industriels: *See*—
Sibeud, Jean-Paul, 4,532,493, Cl. 340-58.000.

Renken, Terry L.; and Sanderson, John R., to Texaco, Inc. Catalytic process for the coproduction of morpholine and 2-(2-hydroxyethoxy)ethylamine from diethylene glycol. 4,532,324, Cl. 544-106.000.

Renker, Wolfgang: *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Muller, Christina; Kober, Roland; and Renker, Wolfgang, 4,532,068, Cl. 252-188.280.

Renner, Robert E., to GTE Automatic Electric Inc. Parity checking arrangement for a remote switching unit network. 4,532,624, Cl. 370-13.000.

Renz, Dieter; and Loper, Bernd, to Daimler-Benz Aktiengesellschaft. Wheel cover for wheels of a passenger motor vehicle. 4,531,786, Cl. 301-37.0PB.

Research Foundation of State University of New York, The: *See*—
Springer, Charles S., Jr.; Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., 4,532,217, Cl. 436-79.000.

Revett, Lowell W., to Halliburton Company. Cement placement methods. 4,531,583, Cl. 166-253.000.

Rezanka, Richard L.; and Finn, Bernard J., to General Motors Corporation. Suspension strut for vehicles with onboard service of shock absorber cartridge. 4,531,759, Cl. 280-668.000.

Rheinmetall GmbH.: *See*—
Bartels, Wolfgang, 4,531,447, Cl. 89-37.700.

Rhone-Poulenc Agrochimie: *See*—
Cordier, Georges; and Fouilloux, Pierre, 4,532,350, Cl. 564-412.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Dupin, Thierry, 4,532,119, Cl. 423-230.000.
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,532,315, Cl. 528-14.000.

Ricci, Marco: *See*—
Venturello, Carlo; and Ricci, Marco, 4,532,079, Cl. 260-413.000.

Richards, Mark S. Methods of knitting brassiere blank, manufacturing brassiere, and products. 4,531,525, Cl. 128-489.000.

Richardson, Richard W., to Ohio State University, The. Apparatus and method for viewing molten pools in arc welding. 4,532,408, Cl. 219-130.010.

Richter, Horst: *See*—
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Muller, Christina; Kober, Roland; and Renker, Wolfgang, 4,532,068, Cl. 252-188.280.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Stability control in underground workings adjacent an in situ oil shale retort. 4,531,783, Cl. 299-2.000.

Ricoh Company, Ltd.: *See*—
Tanaka, Hidetake, 4,532,463, Cl. 318-616.000.
Tsukioka, Yasunori, 4,532,379, Cl. 179-2.00R.

Ricwil, Incorporated: *See*—
Weitzel, Harold B.; and Parman, David G., 4,532,375, Cl. 174-107.000.

Riddle, Harry W.: *See*—
Muse, John F.; Riddle, Harry W.; Zeiler, Frank S.; and Buruato, Juventino, 4,531,582, Cl. 166-241.000.

Ridgway, Thomas H.: *See*—
Shah, Ramesh M.; and Ridgway, Thomas H., 4,532,414, Cl. 219-308.000.

Riemersma, Coenraad E.: *See*—
Persson, Louis T.; and Riemersma, Coenraad E., 4,531,999, Cl. 156-580.200.

Riker Laboratories, Inc.: *See*—
Wade, James J., 4,532,242, Cl. 514-258.000.

Rinehart, Jay K., to PPG Industries, Inc. Antidotal compound and method. 4,531,970, Cl. 71-118.000.

Ringle, Eric P.: *See*—
Jandrasi, Frank J.; and Ringle, Eric P., 4,531,539, Cl. 137-375.000.

Ripper, Wolfgang: *See*—
Eckert, Konrad; Ripper, Wolfgang; and Wessel, Wolf, 4,531,499, Cl. 123-571.000.

Rish, Fred D., to Ales, Henry. Ratchet puller for nails and staples. 4,531,716, Cl. 254-21.000.

Ristvedt-Johnson, Inc.: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,531,531, Cl. 133-3.00A.

Ristvedt, Victor G.: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,531,531, Cl. 133-3.00A.

Rite-Hite Corporation: *See*—
Swessel, Michael A.; and Hahn, Norbert, 4,531,248, Cl. 14-71.300.

Ritter, Helmut; Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Bis[(fluoro- and chloro-methylthio)formamides], a process for their preparation and their use. 4,532,259, Cl. 514-608.000.

Robert Bosch GmbH: *See*—
Bodig, Bernd; Kull, Hermann; and Schleupen, Richard, 4,532,437, Cl. 307-358.000.
Brill, Klaus; and Grothe, Wolfgang, 4,532,181, Cl. 428-336.000.
Dietrich, Walter, 4,531,931, Cl. 493-317.000.
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; and Reber, Harald, 4,532,013, Cl. 204-1.00T.
Eckert, Konrad; Ripper, Wolfgang; and Wessel, Wolf, 4,531,499, Cl. 123-571.000.
Esper, Friedrich J.; Fischer, Hermann; Friese, Karl-Hermann; and Scharner, Peter, 4,532,492, Cl. 338-34.000.
Frister, Manfred, 4,532,539, Cl. 357-81.000.
Gansert, Willi; Hussmann, Dieter; and Jakob, Gert, 4,531,796, Cl. 339-60.00M.
Knapp, Heinrich, 4,531,678, Cl. 239-533.300.
Seifert, Kurt; and Hofmann, Karl, 4,531,676, Cl. 239-453.000.

Robertshaw Controls Company: *See*—
Gunter, James C., 4,531,279, Cl. 29-509.000.

Robeson, Lloyd M., to Union Carbide Corporation. Poly(aryl ether) blends. 4,532,288, Cl. 524-375.000.

Robinson, Carl W., to International Business Machines Corporation. Electric motor mounting arrangement. 4,531,700, Cl. 248-672.000.

Robinson, John M.; and Rodgers, Gregory D., to Vitek Systems, Inc. β-Streptococcus selective medium. 4,532,206, Cl. 435-36.000.

Rockarts, Rene L.: *See*—
Stuhldreher, Terrence M.; and Rockarts, Rene L., 4,531,902, Cl. 425-408.000.

Rockwell International Corporation: *See*—
Cheung, Derek T., 4,532,424, Cl. 250-338.000.
Silagi, Edward G., 4,532,478, Cl. 330-151.000.
Treu, Dennis M., 4,531,701, Cl. 248-676.000.

Rockwell, Lynn H., to Sanders Associates, Inc. Electronic pen with switching mechanism for selectively providing tactile or non-tactile feel. 4,532,376, Cl. 178-18.000.

Rodgers, Gregory D.: *See*—
Robinson, John M.; and Rodgers, Gregory D., 4,532,206, Cl. 435-36.000.

Roe, William J.; and Perisho, Jacqueline L., to Nalco Chemical Company. Dewatering agent compositions for sulfide materials. 4,532,049, Cl. 210-728.000.

Roehringer, Arno, to Daimler-Benz Aktiengesellschaft. Power steering system. 4,531,602, Cl. 180-143.000.

Rogers Corporation: *See*—
Schilling, Donald P., 4,532,572, Cl. 361-306.000.

Rogers, Walter C., Jr., to Parma Corporation. Recliner chair incorporating linkage and track systems. 4,531,778, Cl. 297-85.000.

Rogo, Casimir; and Urbani, Aldo. Drum pump. 4,531,886, Cl. 415-90.000.

Rohrer, Dan: *See*—
Hait, Paul W.; and Rohrer, Dan, 4,531,505, Cl. 126-9.00R.

Rolfes, Thomas A. Exterior orthopedic adjustable hinge brace. 4,531,515, Cl. 128-87.00R.

Rolls-Royce Limited: *See*—
Barry, Brian; and Freeman, Christopher, 4,531,362, Cl. 60-226.100.
Smith, Stanley, 4,531,358, Cl. 60-39.080.

Romano, Salvatore A., Jr., to United States of America, Army. Tone signalling adapter for a telephone set. 4,532,380, Cl. 179-2.00C.

Rommerskirchen, Hans J.: *See*—
Schmid, Karl; Baumann, Horst; and Rommerskirchen, Hans J., 4,532,076, Cl. 252-557.000.

Ronconi, Umberto, to Albe S.A. Device for grasping, automatically centering and aligning the longitudinal axis of long bodies according to the working axis. 4,531,772, Cl. 294-115.000.

Roper, Jerry M.: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,532,356, Cl. 568-315.000.

Rosenbaum, Stanley D.; and Holy, Zdenek, to Northern Telecom Limited. Active impedance line feed circuit. 4,532,381, Cl. 179-18.0FA.

Rosenbaum, Stanley D.: *See*—
Keriakos, Magdy H.; and Rosenbaum, Stanley D., 4,532,384, Cl. 179-170.00G.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Benzylated phenols. 4,532,059, Cl. 252-52.00R.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Stabilized rubber or lubricant compositions containing mercaptoalkyl esters of hindered phenols. 4,532,286, Cl. 524-289.000.

Rosenthal Technik AG: *See*—
Forster, Siegfried; Schindler, Stefan R.; and Keller, Hartmut, 4,531,908, Cl. 431-215.000.

Roskell, Derek; Schabowski, John V.; Guttag, Karl M.; and McDonough, Kevin C., to Texas Instruments Incorporated. Single chip processor connected to an external memory chip. 4,532,587, Cl. 364-200.000.

Ross, Charles W., to General Signal Corporation. Optimizing combustion air flow. 4,531,905, Cl. 431-12.000.

Ross, Dieter; and Ostertag, Klaus, to Erwin Sick GmbH Optik-Elektronik. Fault detection apparatus for material webs. 4,532,430, Cl. 250-572.000.

Ross, William J.: *See*—
Baker, Stephen R.; Lindstrom, Terry D.; Jamieson, William B.; and Ross, William J., 4,532,257, Cl. 514-470.000.

Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. High temperature stable adhesive compositions employing aromatic polyimide and polyisoimide bis-acetylene additives. 4,532,270, Cl. 523-176.000.

Rotec Industries, Inc.: *See*—
Oury, Robert F.; and Arndt, Charles J., 4,531,630, Cl. 198-505.000.

Rotpunkt Dr. Anso Zimmermann: *See*—
Zimmermann, Anso, 4,531,383, Cl. 62-457.000.

Roussel Uclaf: *See*—
Tully, Wilfred R., 4,532,243, Cl. 514-258.000.

Royer, Michele, to Honeywell Inc. Method for forming a pressure sensor. 4,531,267, Cl. 29-25.350.

RTE Corporation: *See*—
Muench, Frank J., Jr.; and Makal, John M., 4,532,386, Cl. 200-11.0TC.

Rubbermaid Commercial Products Inc.: *See*—
Szablak, Michael J.; and Tomblin, Glen E., 4,531,437, Cl. 83-165.000.

Rubbermaid Incorporated: *See*—
McClelland, Donald R., 4,532,397, Cl. 219-10.55E.

Rubens, Louis C., to Dow Chemical Company, The. Better foamable styrene and other olefin polymer compositions. 4,532,264, Cl. 521-146.000.

Rubinsky, Boris, to University of California, The Regents of The. Directional solidification for the controlled freezing of biomaterials. 4,531,373, Cl. 62-63.000.

Rudish, Ronald M.; and McVeigh, Peter J. Phased array system to produce, steer and stabilize non-circularly-symmetric beams. 4,532,519, Cl. 343-372.000.

Ruegg, Rudolf: *See*—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,532,355, Cl. 568-9.000.

Ruell, Hartwig, to Siemens Corporate Research & Support, Inc. Personal authentication system. 4,532,508, Cl. 340-825.340.

Ruggles, Wesley, Jr.: *See*—
Willcocks, Martin E. G., 4,532,647, Cl. 381-22.000.

Ruhl, Erich; and Thenner, Johann, to Ruhl, Erich. Filler system for a non-flammable rigid foam and use of the rigid foam as a building material. 4,532,261, Cl. 521-103.000.

Ruhrchemie Aktiengesellschaft: *See*—
Cornils, Boy; Wiebus, Ernst; and Breitkopf, Norbert, 4,532,354, Cl. 564-498.000.

Rush-Presbyterian-St. Luke's Medical Center: *See*—
Djordjevich, Ljubomir; Ivankovich, Anthony D.; and Gottschalk, William, 4,532,130, Cl. 424-101.000.

Rushforth, Calvin, to Kennecott Corporation. Fluid cooled casting apparatus having improved fluid seal. 4,531,568, Cl. 164-439.000.

Russell, David B.: *See*—
Gitlitz, Melvin H.; Russell, David B.; and Leiner, Howard H., 4,532,269, Cl. 523-122.000.

Russell, Melvin E., Jr.: *See*—
Marrero, Raul; and Russell, Melvin E., Jr., 4,531,472, Cl. 116-28.00R.

Russell, Richard H. Automated machine. 4,531,884, Cl. 414-729.000.

Rydell, Mark A.: *See*—
Van Tassel, Robert A.; Rydell, Mark A.; and Schjeldahl, Gilmore T., 4,531,943, Cl. 604-280.000.

Ryer, Jack; Bloch, Ricardo; and Deen, Harold E., to Exxon Research & Engineering Co. Additive for power transmission shift fluids. 4,532,062, Cl. 252-78.100.

Rynhart Research Limited: *See*—
Wardell, Gerald E., 4,532,469, Cl. 324-61.00R.

Ryser, Gottlieb: *See*—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,532,355, Cl. 568-9.000.

S.A.I.A.G. S.p.A.: *See*—
Ballocca, Guido; and Azzola, Roberto, 4,531,326, Cl. 49-497.000.

S. C. Johnson & Son, Inc.: *See*—
Gueldenzopf, Thomas D., 4,532,063, Cl. 252-90.000.

Saathoff, Donald G. Timing tool. 4,531,295, Cl. 33-180.0AT.

Sach, George S., to Smith Kline & French Laboratories Limited. 3,5-Substituted-2-pyridylalkylamino compounds having histamine H_1-antagonist activity. 4,532,252, Cl. 514-357.000.

Sackett, James A.: *See*—
McNeel, William O.; and Sackett, James A., 4,532,450, Cl. 310-329.000.

Sackmann, Karl H.; and Anselment, Christoph, to Erwin Sick GmbH Optik-Elektronik. Elongate resilient section at the closure edge of a closure. 4,532,388, Cl. 200-61.430.

Safiuddin, Mohammed; and Surana, Bhupendra S., to Westinghouse Electric Corp. Digital inertia compensation generator and reel motor drive system embodying the same. 4,532,597, Cl. 364-471.000.

Sagara, Kikuo; and Kojima, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Video reproducing apparatus. 4,532,555, Cl. 358-310.000.

Sahler, John T., to Quaker Oats Company, The. Action croquet post. 4,531,736, Cl. 273-56.000.

St. Regis Paper Company: *See*—
Taylor, John A.; and Fridhandler, Robert M., 4,532,158, Cl. 427-355.000.

Saito, Mikio: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Saito, Mikio; and Futatsuya, Fumio, 4,531,964, Cl. 71-92.000.

Saito, Norio: *See*—
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; and Saito, Norio, 4,532,077, Cl. 260-245.400.

Saito, Tadao; and Ogawa, Riichi, to Yoshino Kogyosho Co., Ltd. Tapping stopper. 4,531,657, Cl. 222-108.000.

Saitoh, Keishi; and Arao, Kozo, to Canon Kabushiki Kaisha. Photoconductive member. 4,532,198, Cl. 430-84.000.

Sakai, Tetsushi; Kobayasi, Yoshizi; Yamauchi, Hironori; and Arita, Yoshinobu, to Nippon Telegraph and Telephone Public Corp. Bipolar transistors having vertically arrayed collector-base-emitter with novel polycrystalline base electrode surrounding island emitter and method of making same. 4,531,282, Cl. 29-578.000.

Sakamoto, Kiyoshi: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.

Sakamoto, Yukio; and Tanabe, Takeshi, to Murata Manufacturing Co., Ltd. Structure of the feed-through capacitor. 4,532,573, Cl. 361-307.000.

Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, to Mitsui Toatsu Chemicals, Incorporated. 2-Thiazolamine derivatives, process for preparing same, and pharmaceutical compositions comprising same. 4,532,137, Cl. 514-371.000.

Sakata, Yoshiyasu, to Honda Giken Kogyo Kabushiki Kaisha. Ventilation device for fuel tanks. 4,531,653, Cl. 220-85.00S.

Sako, Tomoyuki; Sawaki, Saeko; Sakurai, Toshizo; Mutai, Masahiko; and Kondo, Isamu, to Kabushiki Kaisha Yakult Honsha. Coliform bacillus having a gene for the production of staphylokinase and a process for production of staphylokinase therewith. 4,532,211, Cl. 435-172.300.

Sakurai, Masao: *See*—
Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, 4,531,378, Cl. 62-217.000.

Sakurai, Toshizo: *See*—
Sako, Tomoyuki; Sawaki, Saeko; Sakurai, Toshizo; Mutai, Masahiko; and Kondo, Isamu, 4,532,211, Cl. 435-172.300.

Salacuse, Frank, to Super Glue Corporation. Clamping device and display system. 4,531,636, Cl. 206-461.000.

Salcedo, Javier F., to ABCO Hardware and Builders Supply, Inc. Method and apparatus for detecting improper polarity in a power distribution system. 4,532,569, Cl. 361-76.000.

Saleeb, Fouad Z.; and Pickup, John G., to General Foods Corporation. Fixing volatiles in an amorphous substrate and products therefrom. 4,532,145, Cl. 426-650.000.

Salome, Frederik, to Berger, Jenson & Nicholson, Limited. Anti-fouling compositions. 4,531,975, Cl. 106-18.300.

Sampath, Krishnaswamy: *See*—
Phelps, Craig H.; and Sampath, Krishnaswamy, 4,531,404, Cl. 73-38.000.

Samson, Ralph D. Turkey calling aid. 4,531,924, Cl. 446-213.000.

Sanaka, Hideaki, to Daieigiken Inc. Apparatus for scraping off heads of fish and crustacea. 4,531,261, Cl. 17-71.000.

Sanborn, Harold C.: *See*—
Griffith, James B.; and Sanborn, Harold C., 4,531,270, Cl. 29-156.80B.

Sanborn, Robert S.: *See*—
West, Francis, Jr., 4,531,298, Cl. 33-301.000.

Sander, Hans: *See*—
Lenz, Werner; Sander, Hans; and Moller, Dieter, 4,532,300, Cl. 525-124.000.

Sander, Lars: *See*—
Collin, Thorbjorn; Erikmats, Borje; Forsberg, Svante; Goransson, Harry; Sander, Lars; and Solver, Carl E., 4,532,499, Cl. 340-644.000.

Sanders Associates, Inc.: *See*—
Rockwell, Lynn H., 4,532,376, Cl. 178-18.000.

Sanders, Joseph E. Unlatching tool to uncouple semi-trailer trucks. 4,531,274, Cl. 29-267.000.

Sanders, Royden C., Jr.; and Forsyth, John L., to Sanders, Royden C., Jr.; and Forsyth, John L. Dot matrix print head. 4,531,848, Cl. 400-124.000.

Sanderson, John R.: *See*—
Renken, Terry L.; and Sanderson, John R., 4,532,324, Cl. 544-106.000.

Sandor, Jules A. Escape ladder. 4,531,612, Cl. 182-196.000.

Sandoz Ltd.: *See*—
Bill, Rudolf; and Wolf, Rainer, 4,532,287, Cl. 524-343.000.
Bohler, Hans; and Weisskopf, Ernst, 4,531,979, Cl. 148-6.270.

Sandt, David K.; Mitlyng, Arthur V., Jr.; Ilaug, Harold W.; and Quenemoen, Robert D. Water supply winterizing system. 4,531,538, Cl. 137-334.000.

Sanji, Koichiro: *See*—
Kadowaki, Toshio; and Sanji, Koichiro, 4,532,273, Cl. 523-402.000.

Santrade Ltd.: *See*—
Bylund, Sven O., 4,531,864, Cl. 407-114.000.

Santy, James L. Ski and pole holder. 4,531,661, Cl. 224-191.000.

Sanyo Electric Co., Ltd.: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.

Sasaki, Itsuo; Suzuki, Hiroaki; and Kamichika, Masakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Adaptive delta codec which varies a delta signal in accordance with a characteristic of an input analog signal. 4,532,494, Cl. 340-347.0AD.

Sasaki, Kiichi; Kawade, Tateo; and Nemoto, Seiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular seat belt device. 4,531,762, Cl. 280-801.000.

Sasaki, Minoru: *See*—
Ikeda, Takayuki; Kouhara, Kazuo; and Sasaki, Minoru, 4,532,293, Cl. 524-754.000.

Sasaki, Satoshi: *See*—
Suzuki, Migaku; Kobayashi, Toshio; Sasaki, Satoshi; and Imai, Shigeo, 4,532,173, Cl. 428-218.000.

Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, to Konishiroku Photo Industry Co., Ltd. Coupler for photography. 4,532,202, Cl. 430-552.000.

Sasaki, Toshio: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Sasaoka, Takashi; and Mitani, Tsuneyoshi, to Musashi Co., Ltd.; and Musashi Engineering Kabushiki Kaisha. Apparatus for counting paper sheets. 4,532,421, Cl. 250-223.00R.

Saska, Thomas J.: *See*—
Burack, Robert D.; and Saska, Thomas J., 4,532,396, Cl. 219-10.49R.

Sassenfeld, Helmut M.: *See*—
Brewer, Stephen J.; and Sassenfeld, Helmut M., 4,532,207, Cl. 435-68.000.

Sato, Akira, to Nippon Kogaku K.K. Focus adjusting device in binocular. 4,531,817, Cl. 350-556.000.

Sato, Hideki: *See*—
Koizumi, Haruyuki; Kitao, Zenichi; and Sato, Hideki, 4,532,393, Cl. 200-159.00R.

Sato, Hisao: *See*—
Tsuji, Teruji; Sato, Hisao; and Hamashima, Yoshio, 4,532,233, Cl. 514-63.000.

Sato, Koji; and Kawano, Hikaru, to Musashi Co., Ltd.; and Hitachi Denshi Engineering Kabushiki Kaisha. Device for aligning and banding a pile of paper sheets. 4,531,344, Cl. 53-447.000.

Sato, Kuniaki; Muto, Shinichiro; Yanagishima, Fumiya; and Shimoyama, Yuji, to Kawasaki Steel Corporation. Low NO_x level combustion method in a radiant tube burner and a burning apparatus used for the method. 4,531,904, Cl. 431-10.000.

Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, to Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Yuka Fine Chemicals Co., Ltd.; and Toray Industries, Inc. Epoxy resin compositions. 4,532,308, Cl. 525-482.000.

Sato, Yasuji: *See*—
Nakayama, Yasunobu; Kunii, Takeshi; and Sato, Yasuji, 4,532,378, Cl. 179-2.0DP.

Satou, Kouzou, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit breaker. 4,532,571, Cl. 361-93.000.

Sauer, Burkhard: *See*—
Schmidt, Hans J.; Diesel, Hans-Dieter; and Sauer, Burkhard, 4,532,157, Cl. 427-262.000.

Sauer, Gale E., to Donn Incorporated. Beam splice for supporting grid systems. 4,531,340, Cl. 52-726.000.

Sauter, Fritz: *See*—
Sittenthaler, Wilhelm; and Sauter, Fritz, 4,532,136, Cl. 514-277.000.

Savin Corporation: *See*—
Landa, Benzion, 4,531,824, Cl. 355-3.0FU.

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Sawamura, Mitsuharu, to Canon Kabushiki Kaisha. Method and device for controlling the film thickness of evaporated film. 4,531,838, Cl. 356-382.000.

Sawin, Steven P.: *See*—
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Saxby, Michael E., to Hilvenna Limited. Compressed gas powered ammunition for small arms. 4,531,458, Cl. 102-440.000.

Saxton, Ronald P. Hanging mobile greeting card. 4,531,319, Cl. 40-539.000.

Sayler, William H.; and White, Justin C., to T.A.S., Inc. Solid fuel pulverizing and burning system and method and pulverizer and burner therefor. 4,531,461, Cl. 110-106.000.

Scanlon, Michael J.: *See*—
Wang, Samuel S.; and Scanlon, Michael J., 4,532,031, Cl. 209-166.000.

Scantlebury, Todd V.; Ambruster, Jeanne B.; Bolton, Carl W.; Campbell, Stephen E.; and Green, La Thaggar, III, to W. L. Gore & Associates, Inc. Dental implant with expanded PTFE gingival interface. 4,531,916, Cl. 433-173.000.

Scarrow, David: *See*—
Dunn, David C.; and Scarrow, David, 4,531,519, Cl. 128-327.000.

Scavo, Frank A.: *See*—
Laws, Dee G.; Scavo, Frank A.; Laws, E. Wayne; and Scavo, Frank R., 4,531,776, Cl. 296-190.000.

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Schabowski, John V.: *See*—
Roskell, Derek; Schabowski, John V.; Guttag, Karl M.; and McDonough, Kevin C., 4,532,587, Cl. 364-200.000.

Schack, Peter: *See*—
Freller, Helmut; Hassler, Heinrich; Schack, Peter; and Schultz, Ludwig, 4,532,174, Cl. 428-215.000.

Scharen, Walter: *See*—
Meyer, Jacques; and Scharen, Walter, 4,531,965, Cl. 71-92.000.

Scharner, Peter: *See*—
Esper, Friedrich J.; Fischer, Hermann; Friese, Karl-Hermann; and Scharner, Peter, 4,532,492, Cl. 338-34.000.

Scheckel, William D. Starting device for gasoline engines. 4,531,482, Cl. 123-179.0SE.

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O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,532,170, Cl. 428-143.000.

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Nickolson, Robert; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; and Haberey, Martin, 4,532,236, Cl. 514-184.000.

Scherowsky, Gunter; and Butow, Michael, to Merck Patent Gesellschaft mit beschrankter Haftung. Anthraquinone dyestuffs for liquid crystal dielectrics. 4,532,069, Cl. 252-299.100.

Schilling, Donald P., to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,532,572, Cl. 361-306.000.

Schindler, Stefan R.: *See*—
Forster, Siegfried; Schindler, Stefan R.; and Keller, Hartmut, 4,531,908, Cl. 431-215.000.

Schinski, William L.; and Lukens, Raymond J., to Chevron Research Company. Thiopyruvic amide compounds. 4,531,968, Cl. 71-98.000.

Schjeldahl, Gilmore T.: *See*—
Van Tassel, Robert A.; Rydell, Mark A.; and Schjeldahl, Gilmore T., 4,531,943, Cl. 604-280.000.

Schlag, Johannes: *See*—
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,532,188, Cl. 428-500.000.

Schlauer, Johann: *See*—
Doerges, Alexander; Schlauer, Johann; Kriebel, Manfred; and Hude, Anton, 4,532,116, Cl. 423-226.000.

Schleicher, Robert G.: *See*—
Smith, Stanley B., Jr.; Schleicher, Robert G.; and Waterman, Jon N., 4,531,836, Cl. 356-316.000.

Schleimer, Stephen I.: *See*—
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

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Bodig, Bernd; Kull, Hermann; and Schleupen, Richard, 4,532,437, Cl. 307-358.000.

Schlosser, Rainer: *See*—
Durslen, Heinz; Faust, Winifried; and Schlosser, Rainer, 4,532,010, Cl. 202-248.000.

Schlough, James R.: *See—*
Lukas, David C.; Moser, James R.; and Schlough, James R., 4,531,724, Cl. 271-166.000.

Schmid, Eckhardt: *See—*
Botz, Jakob; Mutschler, Erich; Prohaska, Hans; Schmid, Eckhardt; and Scholl, Wolfgang, 4,531,419, Cl. 74-388.0PS.

Schmid, Elisabeth: *See—*
Lagger, Helmut; Schmid, Elisabeth; and Haider, Erich, 4,532,638, Cl. 375-17.000.

Schmid, Karl; Baumann, Horst; and Rommerskirchen, Hans J., to Henkel Kommanditgesellschaft auf Aktien. Aqueous anionic surfactant concentrates containing viscosity reducing agents. 4,532,076, Cl. 252-557.000.

Schmidt, Douglass N., to BASF Wyandotte Corporation. Low temperature stable, emulsifiable vitamin A concentrates. 4,532,133, Cl. 514-725.000.

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Schminke, Wolfram, to BBC Brown, Boveri & Company, Limited. Coaxial RF matching transformer having line sections simultaneous adjustable while retaining a fix transformer line length. 4,532,483, Cl. 333-34.000.

Schmitt, Frederick L.: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,532,361, Cl. 568-382.000.

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Behrens, Herbert; Marx, Rainer; and Schmitt, Jurgen, 4,532,526, Cl. 346-107.00R.
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Schmutz, Michel: *See—*
Gerber, Hermann; and Schmutz, Michel, 4,532,444, Cl. 310-41.000.

Scholl, Wolfgang: *See—*
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Scholz, Romanus; Heidemeyer, Paulus; and Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Arrangement for driving the generator of a vehicle, in particular a passenger automobile. 4,531,605, Cl. 180-165.000.

Schonberger, Milton. Disposable thermometer probe and rating technique therefor. 4,531,842, Cl. 374-1.000.

Schrader, Heinolf: *See—*
Schroder, Gunter; Eichhorn, Rudolf; and Schrader, Heinolf, 4,531,682, Cl. 242-54.00R.

Schramm, Matthias: *See—*
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.

Schreiber, William L.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,532,364, Cl. 568-444.000.

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Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Diederich, Gerd, 4,531,567, Cl. 164-415.000.

Schroder, Gunter; Eichhorn, Rudolf; and Schrader, Heinolf, to Deutche Gesellschaft fur Wiederaufarbeitung von Kernrennstoffen GmbH. Apparatus for feeding a wire from a coil to a processing station. 4,531,682, Cl. 242-54.00R.

Schrotter, Eberhard: *See—*
Teubner, Herbert; Kramer, Axel; Weuffen, Wolfgang; Schrotter, Eberhard; and Grubel, Gerhard, 4,532,367, Cl. 568-745.000.

Schultz, Ludwig: *See—*
Freller, Helmut; Hassler, Heinrich; Schack, Peter; and Schultz, Ludwig, 4,532,174, Cl. 428-215.000.

Schulz, Guenter: *See—*
Buschmann, Ernst; Schulz, Guenter; Heilen, Gerd; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,532,234, Cl. 514-63.000.

Schuss, Werner; and Weber, Walter, to Siemens Aktiengesellschaft. Dental spray hand piece. 4,531,912, Cl. 433-80.000.

Schuster, Gary B. A., to Owens-Corning Fiberglas Corporation. Precious metal vaporization reduction. 4,532,184, Cl. 428-433.000.

Schutz, Eberhard, to Wolf-Gerate GmbH. Lawn mower with wheel drive. 4,531,347, Cl. 56-10.500.

Schutz, Udo. Sailboard and process for its production. 4,531,922, Cl. 441-74.000.

Schwabische Huttenwerke GmbH: *See—*
Gessler, Hans, 4,531,876, Cl. 414-325.000.

Schwardt, Manfred, to CORTEC, Wellpappenmaschinenhandelsund Service GmbH. Apparatus for printing, punching and/or cutting to size unwound cardboard pieces. 4,531,929, Cl. 493-55.000.

Schwartz, Eugene B.: *See—*
Kaye, Gordon E.; Schwartz, Eugene B.; and Sollins, Irving V., 4,531,938, Cl. 604-62.000.

Schwenk, Wolfgang, to General Motors Corporation. Heating and ventilating system for the occupant compartment of a motor vehicle. 4,531,671, Cl. 237-12.30B.

Schwerdt, Paul: *See—*
Weiger, Gunter; Schwerdt, Paul; and Grossner, Horst, 4,531,706, Cl. 251-25.000.

Schwerdtle, Friedhelm: *See—*
Nestler, Hans J.; Horlein, Gerhard; Handte, Reinhard; Bieringer, Hermann; Schwerdtle, Friedhelm; and Langeluddeke, Peter, 4,531,969, Cl. 71-108.000.

Schwertfeger, Werner: *See—*
Siegemund, Gunter; and Schwertfeger, Werner, 4,532,366, Cl. 568-615.000.

Scribner, Albert W. Controls for duplex feeders. 4,531,662, Cl. 226-159.000.

Sears, Roebuck & Co.: *See—*
Gall, John C., 4,531,688, Cl. 242-107.300.

Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,532,125, Cl. 424-47.000.

Seelen, Franciscus J. H. M., to Oce-Nederland B.V. Sheet inverter. 4,531,725, Cl. 271-186.000.

Segal, David L., to United Kingdom Atomic Energy Authority. Process for producing aluminium containing sols. 4,532,072, Cl. 252-313.100.

Seifert, Kurt; and Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,531,676, Cl. 239-453.000.

Sekiya, Toshifumi: *See—*
Takami, Akio; Matsuura, Toshitaka; Tanaka, Kazutoshi; and Sekiya, Toshifumi, 4,532,179, Cl. 428-335.000.

Selvin, Gerald J., to International Telephone & Telegraph Corporation. Electrical connector grounding ring. 4,531,790, Cl. 339-14.00R.

Sendzimir, Michael G.: *See—*
Turley, John W.; and Sendzimir, Michael G., 4,531,394, Cl. 72-238.000.

Seneker, James A., to Ameron, Inc. Flexibilized chemically resistant epoxy resin. 4,532,299, Cl. 525-122.000.

Seragnoli, Enzo; Mattei, Riccardo; and Dall'Osso, Gastone, to G.D Societa' per Azioni. Axial translation device for partly finished cigarettes. 4,531,629, Cl. 198-458.000.

Sereg, S.A.: *See—*
Bertrand, Pierre C.; and De Paepe, Thijlbert C., 4,532,510, Cl. 340-870.390.

Sermatech International, Inc.: *See—*
Mosser, Mark F.; and Fabiny, William J., 4,532,289, Cl. 524-406.000.

Sevier, Peter E.: *See—*
Polan, Ned W.; Smialek, Raymond J.; Parthasarathi, Arvind; and Sevier, Peter E., 4,532,014, Cl. 204-28.000.

Shachihata Industry Co., Ltd.: *See—*
Hirabayashi, Masao; and Mizutani, Takeshi, 4,531,853, Cl. 401-265.000.

Shackle, Dale R.; Cousin, Michael J.; and Pack, Gary D., to Mead Corporation, The. Method for producing microcapsules by interfacial photopolymerization and microcapsules formed thereby. 4,532,183, Cl. 428-402.220.

Shah, Ramesh M.; and Ridgway, Thomas H., to Data Chem., Inc. Controlled temperature blood warming apparatus. 4,532,414, Cl. 219-308.000.

Shah, Satish C., to Electronic Solutions. Frame for supporting circuit boards. 4,531,640, Cl. 211-41.000.

Sharber, Jerry L., to Sheller-Globe Corporation. Bracket for securing adjustable shelving. 4,531,698, Cl. 248-243.000.

Sharma, Kris: *See—*
Kobiske, Michael; Voigt, William; and Sharma, Kris, 4,531,618, Cl. 188-321.110.

Sharp Kabushiki Kaisha: *See—*
Ishino, Yoshihide, 4,532,472, Cl. 324-122.000.
Nishimura, Katsuji; and Yamamoto, Hachizou, 4,532,417, Cl. 235-379.000.
Nishimura, Katsuji, 4,532,641, Cl. 377-14.000.
Uno, Masaki, 4,532,552, Cl. 358-302.000.

Shaw Industries Limited: *See—*
Steele, Robert E.; Tailor, Dilip K.; and Lakhani, Rajni R., 4,532,168, Cl. 428-99.000.

Shaw, Terrance L. Portable equipment hoist. 4,531,686, Cl. 242-96.000.

Sheldon, Bernard G.; Wingard, Robert E., Jr.; Weinshenker, Ned M.; and Dawson, Daniel J., to Dynapol. Quaternary ammonium group-containing polymers having antimicrobial activity. 4,532,128, Cl. 424-78.000.

Shell Oil Company: *See—*
Dries, Hubertus W. A. A., 4,531,570, Cl. 165-1.000.
Odell, Barbara, 4,532,212, Cl. 435-197.000.
ter Haken, Pieter; and Webb, Shirley B., 4,532,329, Cl. 546-342.000.

Sheller-Globe Corporation: *See—*
Sharber, Jerry L., 4,531,698, Cl. 248-243.000.

Shelton, Allan J., to General Motors Corporation. Adjustable seating arrangement for a tail lamp assembly. 4,532,577, Cl. 362-80.000.

Shenk, Edwin K., to Polaroid Corporation. Extended sonic acceptance angle. 4,531,822, Cl. 354-401.000.

Shepherd, Robert G. Fluid pressure repeating pistol with unitary barrel and hammer assembly. 4,531,503, Cl. 124-76.000.

Sher, Frank T.: *See—*
Balchunis, Robert J.; and Sher, Frank T., 4,532,185, Cl. 428-447.000.

Shetty, Jayarama K.; and Marshall, James J., to Miles Laboratories, Inc. Recovery of acid fungal protease. 4,532,213, Cl. 435-225.000.

Shibagaki, Kazuyoshi; Mori, Yoshihisa; and Moriuchi, Takahiko, to Nitto Electric Industrial Co., Ltd. Circuit substrate with resistance layer and process for producing the same. 4,532,186, Cl. 428-457.000.

Shibata, Minoru; Hayashi, Koichi; and Abe, Katsumi, to U.S. Philips Corporation. Automatically operating electric shaver. 4,531,287, Cl. 30-43.600.

Shibata, Yoshitaka: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.
Shibayama, Akinori; Fujinami, Minpai; and Yoda, Haruo, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Electron beam exposure system. 4,532,598, Cl. 364-491.000.
Shibuya, Kenjiro: *See*—
Ogata, Yohji; Aida, Isao; Murayama, Hirokazu; and Shibuya, Kenjiro, 4,532,409, Cl. 219-137.00R.
Shields, Ronald H.: *See*—
Hileman, Kenneth R.; Shields, Ronald H.; and Tobey, Lance M., 4,531,961, Cl. 65-164.000.
Shima, Katsuhito; and Hanamitsu, Kiyoshi, to Fujitsu Limited. Semiconductor lasers and method for producing the same. 4,532,631, Cl. 372-48.000.
Shimada, Keizo: *See*—
Aito, Yuzo; and Shimada, Keizo, 4,532,275, Cl. 523-468.000.
Shimada, Kiyoshi: *See*—
Kimura, Akira; Ishihama, Masao; Abe, Toshiro; Shimada, Kiyoshi; and Matsui, Shinichi, 4,531,484, Cl. 123-192.00R.
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Saito, Mikio; and Futatsuya, Fumio, to Nippon Kayaku Kabushiki Kaisha. Heterocyclic compound and a herbicidal composition containing said compound. 4,531,964, Cl. 71-92.000.
Shimizu, Tooru: *See*—
Yamaguchi, Keiki; Ogawa, Tadashi; Mitamura, Masayoshi; and Shimizu, Tooru, 4,532,644, Cl. 378-16.000.
Shimizu, Tsuguo: *See*—
Shintani, Yoichi; Wada, Kenichi; Shimizu, Tsuguo; and Yamaoka, Akira, 4,532,589, Cl. 364-200.000.
Shimoda, Hisanori: *See*—
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Shimoyama, Yuji: *See*—
Sato, Kuniaki; Muto, Shinichiro; Yanagishima, Fumiya; and Shimoyama, Yuji, 4,531,904, Cl. 431-10.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Endo, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Ueno, Susumu, 4,532,150, Cl. 427-39.000.
Shinokoku Steel Corporation: *See*—
Kunioka, Saburo; Okuma, Kiwamu; Haga, Tsunehiro; and Kawaguti, Hatsuo, 4,532,105, Cl. 420-451.000.
Shintani, Yoichi; Wada, Kenichi; Shimizu, Tsuguo; and Yamaoka, Akira, to Hitachi, Ltd. Digital data processor with two operation units. 4,532,589, Cl. 364-200.000.
Shionogi & Co., Ltd.: *See*—
Tsuji, Teruji; Sato, Hisao; and Hamashima, Yoshio, 4,532,233, Cl. 514-63.000.
Shioyama, Tod K.: *See*—
Kukes, Simon G.; and Shioyama, Tod K., 4,532,362, Cl. 568-401.000.
Shiozaki, Masakazu; and Nishimura, Hidetaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus and method for cutting a wiring pattern. 4,532,401, Cl. 219-121.0LH.
Shiraki, Kenhachi: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.
Shirai, Takashi: *See*—
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; and Saito, Norio, 4,532,077, Cl. 260-245.400.
Short, Lewis A.; and Horne, Ottis J., to Atlantic Richfield Company. Silicon carbide whisker sheet composites. 4,532,182, Cl. 428-367.000.
Showers, Steven J., to Draper Corporation. Carrier tape for shuttleless looms. 4,531,556, Cl. 139-448.000.
Shows, Everett W.: *See*—
Hitzelberger, Alan L.; and Shows, Everett W., 4,531,359, Cl. 60-39.270.
Shubkin, Ronald L.: *See*—
Swanson, Barry J.; and Shubkin, Ronald L., 4,532,368, Cl. 568-791.000.
Shuey, Harry F.; and Wan, Wankei, to Exxon Research and Engineering Co. Asymmetric polyimide reverse osmosis membrane, method for preparation of same and use thereof for organic liquid separations. 4,532,041, Cl. 210-500.200.
Shull, Robert W., to Anchor Hocking Corporation. Molded plastic cap with sealing liner. 4,531,649, Cl. 215-232.000.
Shulman, Joseph, to Polaroid Corporation, Patent Dept. Color coded ID cards. 4,531,765, Cl. 283-114.000.
Shuster, Frank A.: *See*—
Kroll, Arthur S.; and Shuster, Frank A., 4,531,832, Cl. 355-3.0DD.
Shutt, Donald P.; and Jessup, Thurman W., to Westech Gear Corporation. Marine transmission. 4,531,429, Cl. 74-792.000.
Sibeud, Jean-Paul, to Renault Vehicules Industriels. Device for detecting underinflation of a tire and for measuring the kinetic state of a vehicle wheel and the vehicle. 4,532,493, Cl. 340-58.000.
Siddiqi, M. Sultan, to Miles Laboratories, Inc. Reagent test device. 4,532,107, Cl. 422-56.000.
Siebenlist, John J.: *See*—
Reiner, Richard A.; Siebenlist, John J.; and Clarey, Robert J., 4,532,574, Cl. 361-365.000.
Siegemund, Gunter; and Schwertfeger, Werner, to Hoechst Aktiengesellschaft. Perfluorinated vinyl ethers containing a secondary hydrogen atom, polymers formed therefrom and a process for the preparation of the monomers. 4,532,366, Cl. 568-615.000.
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Meyer, Jacques; and Scharen, Walter, 4,531,965, Cl. 71-92.000.
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Barre, Claude, 4,532,440, Cl. 307-455.000.
Bernt, Paul, 4,532,391, Cl. 200-144.00B.
Dietze, Wolfgang; and Fenzl, Hans J., 4,532,090, Cl. 264-14.000.
Eichelberger, Leo; and Ciszewski, Hans-Joachim, 4,531,551, Cl. 138-129.000.
Freller, Helmut; Hassler, Heinrich; Schack, Peter; and Schultz, Ludwig, 4,532,174, Cl. 428-215.000.
Kuhnlein, Hans; and Stark, Reinhard, 4,531,843, Cl. 374-40.000.
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Reiner, Robert, 4,532,438, Cl. 307-362.000.
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Wurz, Erwin, 4,532,538, Cl. 357-70.000.
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Ruell, Hartwig, 4,532,508, Cl. 340-825.340.
Sigmund, Jerry A., to Aerpat A.G. Multigrip fastener. 4,531,871, Cl. 411-361.000.
Signal Lux S.p.A.: *See*—
Gallone, Cesare, 4,532,390, Cl. 200-83.00B.
Signetics Corporation: *See*—
Blauschild, Robert A., 4,532,479, Cl. 330-261.000.
Silagi, Edward G., to Rockwell International Corporation. Phase adjusted feedforward system utilizing a single amplitude/phase equalizer. 4,532,478, Cl. 330-151.000.
Simerman, Miguel O.: *See*—
Abileah, Adi; Gafni, Giora; and Simerman, Miguel O., 4,532,425, Cl. 250-363.00S.
Simkins, Neil: *See*—
Magill, Robert J.; Gaiger, David J.; and Simkins, Neil, 4,531,534, Cl. 137-75.000.
Simon, James F., to Raytheon Company. Temperature/pressure compensation structure. 4,531,468, Cl. 114-21.00A.
Sinclair, William Y., to Aries Electronics, Inc. Ejector socket for DIP jumpers. 4,531,795, Cl. 339-45.00M.
Singer Company, The: *See*—
Frampton, Victor A.; Drake, James R.; and Slump, William R., 4,532,516, Cl. 343-17.700.
Singer, Robert, to BBC Brown, Boveri & Company, Limited. Component possessing high resistance to corrosion and oxidation, composed of a dispersion-hardened superalloy, and process for its manufacture. 4,531,981, Cl. 148-11.30N.
Singh, Baldev: *See*—
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Sinto Kogio, Ltd.: *See*—
Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, 4,531,705, Cl. 249-134.000.
Sintokogio Ltd.: *See*—
Uzaki, Nagato; Matui, Kazuharu; Toyoda, Shigehiro; and Hikita, Katuro, 4,531,565, Cl. 164-160.100.
Sintra-Alcatel: *See*—
Bauchet, Bernard, 4,531,791, Cl. 339-14.00R.
Sirotnak, Francis M.: *See*—
DeGraw, Joseph I.; Kelly, Lawrence F.; and Sirotnak, Francis M., 4,532,241, Cl. 514-258.000.
Sittenthaler, Wilhelm; and Sauter, Fritz, to Consortium Fur Elektrochemische Industriegesellschaft GmbH. 4,4,4-Trichloro-1-pyridyl-but-2-ene-1-ones and fungicides made therewith. 4,532,136, Cl. 514-277.000.
Sivaslian, Lillian. Two piece juicer. 4,531,457, Cl. 99-507.000.
Skala, Stephen F. Facsimile publishing system. 4,532,554, Cl. 358-257.000.
Skeen, J. Hall: *See*—
Fuller, Oliver C.; Bennett, James R.; and Skeen, J. Hall, 4,531,666, Cl. 228-171.000.
SKF Nova AB: *See*—
Nilsson, Sven W., 4,531,427, Cl. 74-675.000.
Slabaugh, Edward J., to Comptech, Incorporated. Cryogenic pump having maximum aperture throttled part. 4,531,372, Cl. 62-55.500.
Slavinsky, Zinovy M.: *See*—
Kossovsky, Leopold V.; Kravchuk, Jury K.; Boiko, Alexandr V.; Slavinsky, Zinovy M.; Stolyarenko, Georgy E.; Kossovskaya, Irina L.; and Sorokin, Alexandr I., 4,531,934, Cl. 604-22.000.
Slump, William R.: *See*—
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Smialek, Raymond J.: *See*—
Polan, Ned W.; Smialek, Raymond J.; Parthasarathi, Arvind; and Sevier, Peter E., 4,532,014, Cl. 204-28.000.
Smith, Cecil R., Jr.: *See*—
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Smith, Darrel E., to Ingersoll Cutting Tool Company, The. Thread-cutting apparatus. 4,531,863, Cl. 407-113.000.
Smith, Edward D., to Cummins Engine Company, Inc. Solenoid operated unit injector having distinct timing, metering and injection periods. 4,531,672, Cl. 239-89.000.
Smith, Gareth J. Vehicle tailgate extension assembly. 4,531,773, Cl. 296-26.000.
Smith, Isaac L.; and Nelson, Gunner E., to Ethyl Corporation. Silane purification process. 4,532,120, Cl. 423-347.000.
Smith Kline & French Laboratories Limited: *See*—
Ife, Robert J., 4,532,246, Cl. 514-275.000.

Sach, George S., 4,532,252, Cl. 514-357.000.
Smith, R. Scott: *See—*
Kratz, Richard L.; Kiser, Darrel R.; and Smith, R. Scott, 4,531,463, Cl. 110-212.000.
Smith, Randall C. Power amplifier capable of simultaneous operation in two classes. 4,532,476, Cl. 330-123.000.
Smith, Richard T.; and Osthues, Robert H., to Worcester Controls Corporation. Method for fabricating graphite filled sintered metal seats for ball valves. 4,531,273, Cl. 29-157.10R.
Smith, Robert W., to Eneroil Research Ltd. Natural gas adaptor system for automobiles. 4,531,497, Cl. 123-525.000.
Smith, Russell G., to Xomox Corporation. Plug valve for reduced leakage. 4,531,537, Cl. 137-246.220.
Smith, Stanley, to Rolls-Royce Limited. Oil system for aircraft gas turbine engine. 4,531,358, Cl. 60-39.080.
Smith, Stanley B., Jr.; Schleicher, Robert G.; and Waterman, Jon N., to Allied Corporation. Method of emission spectroanalysis. 4,531,836, Cl. 356-316.000.
Smith, Stanley K., to Eaton Corporation. Quality control method. 4,532,599, Cl. 364-552.000.
SmithKlein Beckman Corporation: *See—*
Frazee, James S.; Kaiser, Carl; and Kruse, Lawrence I., 4,532,331, Cl. 548-342.000.
Smitt, Asbjorn, to Christian Rovsing A/S. Time multiplex controlled data system. 4,532,627, Cl. 370-85.000.
Smudin, David J.: *See—*
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Sobel, David D. Bracket for picture frame. 4,531,315, Cl. 40-155.000.
Sobolewski, Barbara: *See—*
Lowd, David L.; Sobolewski, Gerald J.; Lowd, Lynne R.; and Sobolewski, Barbara, 4,531,245, Cl. 4-144.300.
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Sociaal Werkvoorzieningschap Zuidwest-Veluwe: *See—*
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Societa Italo-Britannica L. Mannetti-H. Roberts & C.: *See—*
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Societe Bourguignonne de Mercanique: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Societe Nationale Industrielle et Aerospatiale: *See—*
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Sodeco-Saia AG: *See—*
Gerber, Hermann; and Schmutz, Michel, 4,532,444, Cl. 310-41.000.
Soder, Sven-Harry, to Harry Soder & Son Stenhuggeri AB. Device for supporting workpieces in different positions. 4,531,720, Cl. 269-71.000.
Solc, Jitka, to Dow Chemical Company, The. Method of bonding magnetic particles to a resin particle. 4,532,153, Cl. 427-131.000.
Solex (U.K.) Limited: *See—*
Pagdin, Brian C., 4,531,679, Cl. 239-585.000.
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Soloy Conversions, Ltd.: *See—*
Soloy, Joe I., 4,531,694, Cl. 244-54.000.
Soloy, Joe I., to Soloy Conversions, Ltd. Turbine engine drive and mounting assembly for fixed wing aircraft. 4,531,694, Cl. 244-54.000.
Solver, Carl E.: *See—*
Collin, Thorbjorn; Erikmats, Borje; Forsberg, Svante; Goransson, Harry; Sander, Lars; and Solver, Carl E., 4,532,499, Cl. 340-644.000.
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Matsuura, Tamiaki; Aiba, Takeshi; Fukushima, Takashi; Nishimura, Masanori; Ohtsuki, Hiroshi; Yabuki, Fujio; and Kusakabe, Tomio, 4,531,284, Cl. 29-784.000.
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Sousek, Eugene A., to Piper Industries, Inc. Adjustable multiple row harvester head assembly. 4,531,351, Cl. 56-98.000.
Spatz, David M., to Chevron Research Company. N-substituted-N',N'-disubstituted glycinamide fungicides. 4,532,251, Cl. 514-354.000.
Spearhead Industries, Inc.: *See—*
Thill, Gerald D., 4,531,475, Cl. 118-503.000.
Spears, Harry L. Fluid pump. 4,531,896, Cl. 417-456.000.
Spector, George: *See—*
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Spectrum Manufacturing Inc.: *See—*
Morris, James A.; Hancock, Curtis L.; and Wiley, John L., 4,532,642, Cl. 377-15.000.
Spellman, Stanley. Refuse bag frame for vacuum cleaners. 4,531,258, Cl. 15-327.00R.
Speno International S.A.: *See—*
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De Vilder, Rudy J. C.; and Gryspeerdt, Jose G. T., 4,531,348, Cl. 56-11.600.
Ehrhart, Philip J.; Makofka, Stanley J.; and McLean, Kenneth W., 4,531,349, Cl. 56-13.600.
Fisher, Paul A., 4,532,504, Cl. 340-739.000.
Gaglione, Stanley; and Stangel, John J., 4,532,518, Cl. 343-372.000.
Heidel, Jeffrey C.; and Swartz, Harold L., 4,531,300, Cl. 33-366.000.
Maine, Reuben E., 4,532,637, Cl. 375-10.000.
Price, Robert; and Kurth, Richard R., 4,532,639, Cl. 375-96.000.
Spevack, Jerome S., to Deuterium Corporation. Purification of geothermal steam containing boron, arsenic or mercury. 4,532,114, Cl. 423-210.000.
Spielmann, Norbert; and Bauer, Hermann, to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien. Lock for transmitter cylinder of hydraulic system. 4,531,452, Cl. 92-168.000.
Spilker, Harry: *See—*
Dyck, Hans-Peter; Spilker, Harry; and Gregor, Heinz-Dieter, 4,532,428, Cl. 250-507.100.
Spinello, Ronald P. Dental device and method for gingival retraction and conditioning. 4,531,914, Cl. 433-136.000.
Spoormaker, Hendrik J. Air conditioning system. 4,531,454, Cl. 98-38.00F.
Sporting Aid, Inc.: *See—*
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Sprecker, Mark A., to International Flavors & Fragrances Inc. Norbornyl esters and uses thereof in augmenting or enhancing the organoleptic properties of a consumable material and process for preparing same. 4,532,050, Cl. 252-8.600.
Sprecker, Mark A.: *See—*
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,532,357, Cl. 568-327.000.
Springer, Charles S., Jr.; Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., to Research Foundation of State University of New York, The. Biological uses of shift reagents for the nuclear magnetic resonance of physiological metal cations. 4,532,217, Cl. 436-79.000.
Spurr, Orson K., to Union Carbide Corporation. Curable epoxy resin containing molding compositions. 4,532,274, Cl. 523-457.000.
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Dawson, Marcia I.; and Hobbs, Peter D., 4,532,343, Cl. 514-543.000.
DeGraw, Joseph I.; Kelly, Lawrence F.; and Sirotnak, Francis M., 4,532,241, Cl. 514-258.000.
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Standard Oil Company, The: *See—*
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Standlee, Arlie G.: *See—*
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Mirviss, Stanley B., 4,532,085, Cl. 260-990.000.
Pallos, Ferenc M.; DeBaun, Jack R.; and Teach, Eugene G., 4,532,348, Cl. 564-27.000.
Stay, Kevin E.; and Munch, John E., Jr., to Modine Manufacturing Company. Tank-header plate connection. 4,531,578, Cl. 165-175.000.
Steele, Robert E.; Tailor, Dilip K.; and Lakhani, Rajni R., to Shaw Industries Limited. Heat shrinkable covering. 4,532,168, Cl. 428-99.000.
Steiner, Alois, to Sulzer-Ruti Machinery Works Ltd. Multiple longitudinal traversing shed weaving machine containing a weaving rotor. 4,531,553, Cl. 139-28.000.
Steiner, Gerald E.; and Steiner, Janice A. Apparatus for aperture boards. 4,531,697, Cl. 248-221.200.

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Stempniak, Martin J. Adapter for refuse compacting vehicle. 4,531,881, Cl. 414-572.000.
Stenkvist, Sven E., to ASEA Aktiebolag. DC arc furnace improved hearth construction. 4,532,633, Cl. 373-72.000.
Stenlund, Stig, to HEP Products AB. Method for coating a surface with a layer. 4,532,151, Cl. 427-54.100.
Stephenson, Roger C.: *See—*
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Paszek, Leon E.; and Bernarducci, Ernest, 4,532,066, Cl. 252-144.000.
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Stoerr, Jacques, to Essilor International (Compagnie Generale d'Optique). Measurement method and device for facilitating the mounting of corrective glasses on a spectacle frame. 4,531,297, Cl. 33-200.000.
Stokes, Walter S. Centrifugal fan impeller. 4,531,890, Cl. 416-187.000.
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Stone, Robert A., to United Technologies Corporation. Freewheel ramp/roller clutch with positive lock-out. 4,531,620, Cl. 192-45.000.
Stoughton, Alan M.; Hansen, Charles C., Sr.; Leahy, John P.; and Millar, Robert F., to Danyl Corporation. Event counter and access controller. 4,531,826, Cl. 355-14.0CU.
Stout, David M.; and Yamamoto, Diane M., to American Hospital Supply Corporation. 5-Heteroarylimidazol-2-ones having cardiotonic activity. 4,532,250, Cl. 514-341.000.
Stover, Harris A., to United States of America, Army. Communications network status information system. 4,532,625, Cl. 370-58.000.
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Stricker, John G. Transverse waterjet propulsion with auxiliary inlets and impellers. 4,531,920, Cl. 440-47.000.
Strom, E. Thomas, to Mobil Oil Corporation. Identification of carbon-containing ions adsorbed on ion-exchange resins by nuclear magnetic resonance spectroscopy. 4,532,218, Cl. 436-82.000.
Stuhldreher, Terrence M.; and Rockarts, Rene L., to B. F. Goodrich Company, The. Apparatus for making improved tire curing bladders. 4,531,902, Cl. 425-408.000.
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Suresh, Dev D.; Grasselli, Robert K.; Brazdil, James F.; and Ratka, Frances I., to Standard Oil Company, The. Multiply promoted Sn/Sb oxide catalysts. 4,532,083, Cl. 260-465.300.
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Svoboda, Josef; Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Ski binding. 4,531,758, Cl. 280-628.000.
Swanson, Barry J.; and Shubkin, Ronald L., to Ethyl Corporation. Process for making meta- and para-alkylphenols. 4,532,368, Cl. 568-791.000.

Swanson, C. D., to Chemstyle, Inc. Interior window cover assembly for selective insulating sealable closure of a window opening. 4,531,562, Cl. 160-26.000.

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Szabo, Suzanne: *See—*
Molnar, Francois; Szabo, Suzanne; Statkov, Peter R.; Armijo, Manuel; Sunkel, Carlos; and Cillero, Fernando, 4,532,249, Cl. 514-324.000.

Szajani, Bela; Kiss, Janosne ; Ivony, Jozsefne ; Huber, Iren; Boros, Laszlo ; and Daroczi, Ivan, to Reanal Finomvegyszergyar. Method for isolation of aminoacylase. 4,532,214, Cl. 435-228.000.

T.A.S., Inc.: *See—*
Sayler, William H.; and White, Justin C., 4,531,461, Cl. 110-106.000.

T and R Chemicals, Inc.: *See—*
Arias-Alvarez, Antonio J., 4,532,131, Cl. 424-162.000.

T. Sendzimir, Inc.: *See—*
Turley, John W.; and Sendzimir, Michael G., 4,531,394, Cl. 72-238.000.

Tada, Seiichi, to Du Pont-Mitsui Polychemicals Co., Ltd. Polymer composition. 4,532,307, Cl. 525-451.000.

Taguchi, Mitsukuni, to Takara Nakajima Co., Ltd. Dental syringe. 4,531,913, Cl. 433-80.000.

Taihei Chemical Industrial Co., Ltd.: *See—*
Eguchi, Kiyohisa; Kitamura, Norio; Ohta, George; Okamura, Terumasa; and Yamada, Seiji, 4,532,055, Cl. 252-28.000.

Tailor, Dilip K.: *See—*
Steele, Robert E.; Tailor, Dilip K.; and Lakhani, Rajni R., 4,532,168, Cl. 428-99.000.

Tajima, Yusuke; and Platzker, Aryeh, to Raytheon Company. Hybrid coupler having interlaced coupling conductors. 4,532,484, Cl. 333-116.000.

Tajiri, Tadaaki; and Nishizawa, Hitoshi, to Kimura Chemical Plants Co., Ltd. Process for removal of hydrogen sulfide from gases. 4,532,118, Cl. 423-226.000.

Takagi, Masasi: *See—*
Nishi, Yasuyuki; Takagi, Masasi; and Sakurai, Masao, 4,531,378, Cl. 62-217.000.

Takagi, Mikio: *See—*
Takasaki, Kanetake; Takagi, Mikio; and Koyama, Kenji, 4,532,022, Cl. 204-192.00D.

Takahashi, Fuminobu: *See—*
Tsuchita, Kenji; Domon, Kozo; and Takahashi, Fuminobu, 4,531,413, Cl. 73-637.000.

Takahashi, Kenji: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.
Nakamura, Takashi; and Takahashi, Kenji, 4,532,071, Cl. 252-301.40H.
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.

Takahashi, Kohtei, to Nissan Motor Company, Ltd. Reverse gear selector mechanism with means for preventing transmission slipping out of reverse gear. 4,531,425, Cl. 74-477.000.

Takahashi, Thuneo: *See—*
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Takahashi, Tomohiko, to Kabushiki Kaisha Toshiba. Image forming device. 4,532,525, Cl. 346-76.0PH.

Takahasi, Yasuie; and Haga, Shozi, to Toyota Jidosha Kabushiki Kaisha. Totally synchronized manual transmission units for use in a vehicle. 4,531,418, Cl. 74-339.000.

Takaki, Masamitsu: *See—*
Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, 4,531,555, Cl. 139-429.000.

Takaku, Kazuo: *See—*
Kajiyama, Shigeru; Takaku, Kazuo; Naruse, Akisuke; and Akasu, Akira, 4,531,663, Cl. 228-29.000.

Takakura, Yutaka: *See—*
Ueda, Akiyoshi; Nagasaki, Humiko; Takakura, Yutaka; and Kojima, Shigeru, 4,532,363, Cl. 568-424.000.

Takami, Akio; Matsuura, Toshitaka; Tanaka, Kazutoshi; and Sekiya, Toshifumi, to NGK Spark Plug Co., Ltd. Metal-ceramic bonded material. 4,532,179, Cl. 428-335.000.

Takamizawa, Minoru: *See—*
Endo, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Ueno, Susumu, 4,532,150, Cl. 427-39.000.

Takao, Hisashi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for purifying aminosulfenylcarbamate derivatives. 4,532,339, Cl. 549-470.000.

Takara Nakajima Co., Ltd.: *See—*
Taguchi, Mitsukuni, 4,531,913, Cl. 433-80.000.

Takasaki, Kanetake; Takagi, Mikio; and Koyama, Kenji, to Fujitsu Limited. Process of producing a semiconductor device. 4,532,022, Cl. 204-192.00D.

Takasaki, Kazuhiro: *See—*
Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, 4,532,298, Cl. 525-96.000.

Takeda Chemical Industries, Ltd.: *See—*
Nishino, Hiroshi; and Aibe, Toshio, 4,532,115, Cl. 423-210.000.

Takeda, Masahiro, to Sony Corporation. Memory card having static electricity protection. 4,532,419, Cl. 235-492.000.

Takegawa, Yujiro; and Tsuji, Kanji, to Tsudakoma Kogyo Kabushiki Kaisha. Weft reservoir for fluid jet looms. 4,531,557, Cl. 139-452.000.

Takemae, Yoshihiro; Nakano, Tomio; and Ohira, Tsuyoshi, to Fujitsu Limited. Semiconductor memory device. 4,532,613, Cl. 365-230.000.

Takemoto, Iwao: *See—*
Ozaki, Toshifumi; Ohba, Shinya; Takemoto, Iwao; Nakai, Masaaki; Ando, Haruhisa; Nagahara, Shusaku; Imaide, Takuya; Takahashi, Kenji; and Akiyama, Toshiyuki, 4,532,549, Cl. 358-213.000.

Takenaka, Masahiko: *See—*
Yagasaki, Akio; and Takenaka, Masahiko, 4,531,255, Cl. 15-250.010.

Takeshita, Osamu, to Dainippon Screen Mfg. Co., Ltd. Handling system for IC device. 4,531,909, Cl. 432-37.000.

Takeuchi, Takashi: *See—*
Kimura, Hiroyuki; Iso, Yoshimi; Inoue, Shigeki; Takeuchi, Takashi; and Ohashi, Shin-ichi, 4,532,561, Cl. 360-73.000.

Tamai, Yoshin: *See—*
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Itoi, Kazuo, 4,532,258, Cl. 514-471.000.

Tamatoshi Industries Ltd.: *See—*
Itagaki, Takafumi, 4,531,331, Cl. 52-38.000.

Tamba, Shinichi: *See—*
Fujikawa, Tetsuzo; Tamba, Shinichi; and Miyake, Hitomi, 4,531,487, Cl. 123-198.0DC.

Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Daylight film loading method and apparatus. 4,531,878, Cl. 414-412.000.

Tanabe, Takeshi: *See—*
Sakamoto, Yukio; and Tanabe, Takeshi, 4,532,573, Cl. 361-307.000.

Tanaka, Fuminari; and Iwamoto, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Dynamic read only memory. 4,532,612, Cl. 365-227.000.

Tanaka, Hideo: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; and Saito, Norio, 4,532,077, Cl. 260-245.400.

Tanaka, Hideshi, to Victor Company of Japan, Ltd. Tone control for thermal ink-transfer printing apparatus. 4,532,523, Cl. 346-76.0PH.

Tanaka, Hidetake, to Ricoh Company, Ltd. Method and apparatus for adjusting operation time of servosystem. 4,532,463, Cl. 318-616.000.

Tanaka, Kazunobu: *See—*
Matsuura, Hideharu; Tanaka, Kazunobu; Matsuda, Akihisa; Okushi, Hideyo; Oheda, Hidetoshi; Yamasaki, Satoshi; and Hata, Nobuhiro, 4,532,373, Cl. 136-258.000.

Tanaka, Kazutoshi: *See—*
Takami, Akio; Matsuura, Toshitaka; Tanaka, Kazutoshi; and Sekiya, Toshifumi, 4,532,179, Cl. 428-335.000.

Tanaka, Masashi: *See—*
Konno, Kunio; Tanaka, Masashi; and Ohki, Hiroshi, 4,531,815, Cl. 350-475.000.

Tanaka, Toshiaki: *See—*
Iiyama, Akihiro; Miyazaki, Hiroaki; Etoh, Yukihiro; and Tanaka, Toshiaki, 4,531,491, Cl. 123-357.000.
Kawamura, Yoshihisa; and Tanaka, Toshiaki, 4,531,488, Cl. 123-300.000.

Tanibuchi, Teruo: *See—*
Hayashi, Junnosuke; Tanibuchi, Teruo; and Yamamoto, Shinji, 4,532,291, Cl. 524-496.000.

Tanner, Jesse H. Omnidirectional approach slope indicator system. 4,532,512, Cl. 340-950.000.

Tapmatic Corporation: *See—*
Johnson, Allan S., 4,531,865, Cl. 408-139.000.

Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for improved retention copying. 4,531,827, Cl. 355-14.00R.

Tarumi, Noriyoshi: *See—*
Miwa, Tadashi; Kimura, Kiyoshi; Okamoto, Yukio; and Tarumi, Noriyoshi, 4,531,825, Cl. 355-3.0TR.

Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, to Toray Industries, Inc. Yarn cutter for shuttleless loom. 4,531,555, Cl. 139-429.000.

Tatum, O. Hilt, Jr. Dental implant. 4,531,915, Cl. 433-173.000.

Tau, Ralph. Two-way level. 4,531,301, Cl. 33-382.000.

Taube, Thomas; and Lauterbach-Dammler, Inge, to ARC Technologies Systems Ltd. Electrode for electric arc furnaces. 4,532,634, Cl. 373-93.000.

Taylor, Barry E., to Du Pont de Nemours, E. I., and Company. Thick film conductor composition. 4,532,075, Cl. 252-514.000.

Taylor, John A.; and Fridhandler, Robert M., to St. Regis Paper Company. Apparatus for and a method of metering of coating on a moving web. 4,532,158, Cl. 427-355.000.

Taylor, William, Jr.: *See—*
Golant, Victor; Hsia, David; and Taylor, William, Jr., 4,532,155, Cl. 427-213.000.

TDK Corporation: *See—*
Horimoto, Rioichi, 4,532,566, Cl. 360-132.000.

Teach, Eugene G.: *See—*
Pallos, Ferenc M.; DeBaun, Jack R.; and Teach, Eugene G., 4,532,348, Cl. 564-27.000.

Teijin Limited: *See—*
Aito, Yuzo; and Shimada, Keizo, 4,532,275, Cl. 523-468.000.

Tektronix, Inc.: *See—*
Andrews, Gary D., 4,532,542, Cl. 358-31.000.
Waller, William G., 4,532,605, Cl. 364-900.000.

Teledyne Industries, Inc.: *See—*
Leonard, John, Jr., 4,531,866, Cl. 408-158.000.

Telefonaktiebolaget LM Ericsson: *See—*
Vacha, Lubos J. B.; and Lindborg, Ulf H., 4,532,160, Cl. 427-434.500.

Tennessee Valley Authority: *See—*
Achorn, Frank P.; and Cole, Carl A., Jr., 4,531,962, Cl. 71-29.000.
Moss, Robert D., 4,531,571, Cl. 165-1.000.

Teragakiuchi, Akira: *See—*
Mouri, Yasunori; Abe, Osamu; and Teragakiuchi, Akira, 4,532,593, Cl. 364-431.110.

Teramachi, Hiroshi. Linear slide bearing. 4,531,788, Cl. 308-6.00C.

Teraura, Makoto; and Baba, Masanao, to Nippon Cable System, Inc. Steering system for a boat. 4,531,921, Cl. 440-53.000.

ter Haken, Pieter; and Webb, Shirley B., to Shell Oil Company. 3-(R-thio)propionic acid substituted on adjacent carbon atoms by pyridyl and optionally-substituted phenyl, and corresponding optionally-substituted alkyl esters. 4,532,329, Cl. 546-342.000.

Termet, Pierre. Apparatus with multiple propulsion charges for slaughtering animals. 4,531,322, Cl. 42-1.00M.

Terraillon, Marc; and Mazzucco, Daniel. Electric fabric steaming appliance having a detachable metallic sole-plate. 4,532,411, Cl. 219-245.000.

Terrier, Gerard, to Merlin Gerin. Remote controlled circuit breaker. 4,532,486, Cl. 335-13.000.

Testut-Aequitas: *See—*
Langlais, Jacques F.; and Brisset, Gilbert C., 4,531,600, Cl. 177-185.000.

Teubner, Herbert; Kramer, Axel; Weuffen, Wolfgang; Schrotter, Eberhard; and Grubel, Gerhard, to VEB Jenapharm. Antimicrobially effective derivatives of phenol and methods for their production. 4,532,367, Cl. 568-745.000.

Texaco Development Corporation: *See—*
Suggitt, Robert M., 4,532,227, Cl. 502-180.000.

Texaco Inc.: *See—*
Chafetz, Harry, 4,532,058, Cl. 252-51.50A.
Renken, Terry L.; and Sanderson, John R., 4,532,324, Cl. 544-106.000.

Texas Instruments Incorporated: *See—*
Roskell, Derek; Schabowski, John V.; Guttag, Karl M.; and McDonough, Kevin C., 4,532,587, Cl. 364-200.000.

Textilma AG: *See—*
Muller, Jakob; and Diesner, Ferdinand, 4,531,554, Cl. 139-116.000.

Textron Inc.: *See—*
Jones, Paul W., 4,532,399, Cl. 219-117.100.

Thenner, Johann: *See—*
Ruhl, Erich; and Thenner, Johann, 4,532,261, Cl. 521-103.000.

Theodor Hymmen KG: *See—*
Dorries, Peter; and Wahl, Helmut, 4,532,292, Cl. 524-598.000.

Thill, Gerald D., to Spearhead Industries, Inc. Article decorating device. 4,531,475, Cl. 118-503.000.

Thilly, William G.: *See—*
Crespi, Charles L.; and Thilly, William G., 4,532,204, Cl. 435-29.000.

Thomas, Gerald S.; Punshon, John; and Barr, John A., to Lucas Industries. Fuel injection pumps. 4,531,496, Cl. 123-495.000.

Thomas, Gunter: *See—*
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.

Thomas Jefferson University: *See—*
Osterholm, Jewell L., 4,532,591, Cl. 364-414.000.

Thompson, James L.: *See—*
Nuckels nee Byth, Nancy J.; and Thompson, James L., 4,532,051, Cl. 252-8.55D.

Thompson, Jeffrey W.: *See—*
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,532,021, Cl. 204-159.160.

Thompson, Ralph A., to General Motors Corporation. Bidirectional one-half rate counter. 4,532,643, Cl. 377-45.000.

Thompson, Steven M.: *See—*
Mortvedt, Raymond L.; and Thompson, Steven M., 4,531,738, Cl. 273-73.00C.

Thompson, Thomas D., III, to Georgia Kaolin Company, Inc. Organoclay antiozonant complex. 4,532,285, Cl. 524-255.000.

Thomsen, Karl V.; and Radler, Richard W., to Xerox Corporation. Welding of web materials. 4,532,166, Cl. 428-57.000.

Thorn EMI plc: *See—*
Connor, Ian; and Crawshaw, Paul V., 4,532,455, Cl. 313-579.000.

Thornley, Derek; and Braithwaite, Jack, to Lucas Industries. Relay circuit and relay therefor. 4,532,570, Cl. 361-93.000.

Thurne Engineering Company Limited: *See—*
Antonissen, Peter, 4,531,436, Cl. 83-68.000.

Tighe, Leon. Replacement edge drafting apparatus. 4,531,302, Cl. 33-483.000.

Timex Corporation: *See—*
Zukowski, Raymond W., 4,532,395, Cl. 200-314.000.

Tisbo, Thomas A.; and Garcia, George L., to Suncast Corporation. Portable storage console. 4,531,645, Cl. 211-131.000.

TMC Corporation: *See—*
Svoboda, Josef; Krob, Erwin; and Bauer, Helmut, 4,531,758, Cl. 280-628.000.

Tobey, Lance M.: *See—*
Hileman, Kenneth R.; Shields, Ronald H.; and Tobey, Lance M., 4,531,961, Cl. 65-164.000.

Tobukuro, Kuniaki: *See—*
Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, 4,532,308, Cl. 525-482.000.

Todokoro, Masatoshi. Toy motorcycle. 4,531,751, Cl. 280-1.11R.

Todoroki, Tsunehiko; Hayakumo, Tadahiko; and Fukuda, Katsumi, to Matsushita Electric Industrial Co., Ltd. Thermally actuated devices. 4,531,988, Cl. 148-402.000.

Togo Japan Inc.: *See—*
Yamada, Kazuo, 4,531,459, Cl. 104-53.000.

Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, to Nippon Infrared Industries Co., Ltd. Laser irradiating apparatus. 4,532,400, Cl. 219-121.0LS.

Tojo, Toru; and Sugihara, Kazuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. IC Tester using an electron beam capable of easily setting a probe card unit for wafers & packaged IC's to be tested. 4,532,423, Cl. 250-310.000.

Tokuda, Hiroshi: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Ohtomo, Fumio, 4,531,833, Cl. 356-5.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ichinose, Kazuaki, 4,532,496, Cl. 340-347.0DA.
Iizuka, Tetsuya, 4,532,609, Cl. 365-154.000.
Koike, Hideharu, 4,532,439, Cl. 307-450.000.
Mihara, Yuji; and Gamo, Ryoji, 4,532,600, Cl. 364-565.000.
Nakagawa, Akira, 4,532,621, Cl. 369-111.000.
Nakayama, Yasunobu; Kunii, Takeshi; and Sato, Yasuji, 4,532,378, Cl. 179-2.0DP.
Nemoto, Yoichi, 4,532,583, Cl. 363-96.000.
Sasaki, Itsuo; Suzuki, Hiroaki; and Kamichika, Masakazu, 4,532,494, Cl. 340-347.0AD.
Satou, Kouzou, 4,532,571, Cl. 361-93.000.
Shiozaki, Masakazu; and Nishimura, Hidetaro, 4,532,401, Cl. 219-121.0LH.
Tanaka, Fuminari; and Iwamoto, Yoshihiro, 4,532,612, Cl. 365-227.000.
Tojo, Toru; and Sugihara, Kazuyoshi, 4,532,423, Cl. 250-310.000.
Tomita, Seiji, 4,532,565, Cl. 360-106.000.
Uchida, Yukimasa, 4,532,607, Cl. 365-96.000.
Ueno, Tsuyoshi; Suzuki, Katsumi; and Hirose, Masataka, 4,532,199, Cl. 430-128.000.
Yana, Masasumi; and Ohno, Tadayoshi, 4,532,524, Cl. 346-76.0PH.
Yoshida, Nobuyuki, 4,532,585, Cl. 364-200.000.

Toland, David A. Aerodynamic braking device for downhill skiing. 4,531,763, Cl. 280-810.000.

Tomaszewski, Walter; and Yang, James H. C., to Firestone Tire & Rubber Company, The. Channel end cap. 4,531,339, Cl. 52-716.000.

Tomblin, Glen E.: *See—*
Szablak, Michael J.; and Tomblin, Glen E., 4,531,437, Cl. 83-165.000.

Tominaga, Shinya: *See—*
Matsuda, Norio; Konno, Toshio; Yamamoto, Kaneo; Tominaga, Shinya; Kubo, Susumu; Mori, Yasuyuki; Akiyama, Naoki; and Murakami, Masaki, 4,532,620, Cl. 369-136.000.

Tomita, Hiroyuki: *See—*
Igarashi, Sadayuki; Nagase, Hiroshi; Ninomiya, Hisakazu; Kobayashi, Sumio; and Tomita, Hiroyuki, 4,532,464, Cl. 318-807.000.

Tomita, Seiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape recorder. 4,532,565, Cl. 360-106.000.

Tommis, Norman, to AE PLC. Surface treatment of metal rings. 4,531,985, Cl. 148-16.600.

Tomsa, Vladimir, to Allied Corporation. Electrical connector assembly having locking means. 4,531,802, Cl. 339-90.00R.

Tomuro, Jinichi: *See—*
Koyama, Syuntaro; Tomuro, Jinichi; Miyamoto, Tomohiko; Noguchi, Yoshiki; and Hishinuma, Yukio, 4,531,949, Cl. 48-202.000.

Tonomura, Akira: *See*—
Nomura, Setsuo; Tonomura, Akira; Hamamoto, Nobuo; and Fukuhara, Akira, 4,532,422, Cl. 250-306.000.

Toray Industries, Inc.: *See*—
Sato, Tadahide; Tobukuro, Kuniaki; Sugimoto, Tosio; and Kanayama, Kaoru, 4,532,308, Cl. 525-482.000.
Tatematsu, Hiroyuki; Kusakabe, Haruhiko; Takaki, Masamitsu; Kojima, Gendai; and Miyamoto, Sigeru, 4,531,555, Cl. 139-429.000.

Torii & Co., Ltd.: *See*—
Fujii, Setsuro; Okutome, Toshiyuki; Nakayama, Toyoo; Yaegashi, Takashi; and Kurumi, Masateru, 4,532,255, Cl. 514-466.000.

Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; and Saito, Norio, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Thiazolineazetidinone-type compounds. 4,532,077, Cl. 260-245.400.

Toriyabe, Tetsuo; Ooya, Kunihiko; Nogami, Akira; and Sugawara, Kazunori, to Hokkai Can Co., Ltd. Process for distributing disks and apparatus therefor. 4,531,626, Cl. 198-347.000.

Toro, Henry D.; and Valle, Erick. Cooler assembly. 4,531,381, Cl. 62-372.000.

Tort O., Alejandro, to F.I.P., S.A. De C.V. Expanding gate valve. 4,531,710, Cl. 251-167.000.

Toussaint, Herbert; and Pander, Hans J., to BASF Aktiengesellschaft. Preparation of 3-cyano-2-alkylalkanals. 4,532,082, Cl. 260-465.100.

Towart, Robertson: *See*—
Franckowiak, Gerhard; Boshagen, Horst; Bossert, Friedrich; Goldmann, Siegfried; Meyer, Horst; Wehinger, Egbert; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Towart, Robertson, 4,532,248, Cl. 514-302.000.

Towmotor Corporation: *See*—
Wible, John E., 4,531,615, Cl. 187-9.00E.

Toyoda, Shigehiro: *See*—
Uzaki, Nagato; Matui, Kazuharu; Toyoda, Shigehiro; and Hikita, Katuro, 4,531,565, Cl. 164-160.100.

Toyota Jidosha Kabushiki Kaisha: *See*—
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,531,420, Cl. 74-467.000.
Arai, Hajime; Haga, Shozi; and Nozaki, Tadashi, 4,531,623, Cl. 192-82.00R.
Inagaki, Takafumi; and Ueda, Masahiro, 4,531,432, Cl. 74-866.000.
Takahasi, Yasuie; and Haga, Shozi, 4,531,418, Cl. 74-339.000.

Treu, Dennis M., to Rockwell International Corporation. Multisensor mounting apparatus. 4,531,701, Cl. 248-676.000.

Trigon, Jean, to L'Electricfil Industrie. Bent terminal for electrical connection. 4,531,807, Cl. 339-223.00S.

Tripathy, Sukant K.: *See*—
Carter, Gary M.; Chen, Yung-Jui; and Tripathy, Sukant K., 4,531,809, Cl. 350-96.190.

Trunk, Gerard V.: *See*—
Cantrell, Ben H.; Gordon, William B.; and Trunk, Gerard V., 4,532,515, Cl. 343-16.00R.

Trutzschler GmbH & Co. KG: *See*—
Reiche, Werner, 4,531,262, Cl. 19-145.500.

Tsao, Ying-Yen P.; and Wong, Stephen S., to Mobil Oil Corporation. Preparation of metal-containing zeolite catalysts of increased stability and activity. 4,532,225, Cl. 502-62.000.

Tsuboi, Kunio: *See*—
Deguchi, Yutaka; Kouzuki, Rikuzou; Iinuma, Daiwa; Shiraki, Kenhachi; Sakamoto, Kiyoshi; Tsuboi, Kunio; and Shibata, Yoshitaka, 4,531,823, Cl. 355-3.00R.

Tsuchida, Masanobu: *See*—
Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, 4,531,705, Cl. 249-134.000.

Tsuchita, Kenji; Domon, Kozo; and Takahashi, Fuminobu, to Hitachi, Ltd. Ultrasonic flaw detector driving apparatus of a trackless type. 4,531,413, Cl. 73-637.000.

Tsuda, Yasuo: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,532,202, Cl. 430-552.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Takegawa, Yujiro; and Tsuji, Kanji, 4,531,557, Cl. 139-452.000.

Tsuji, Kanji: *See*—
Takegawa, Yujiro; and Tsuji, Kanji, 4,531,557, Cl. 139-452.000.

Tsuji, Kazuhiro: *See*—
Ito, Katsuo; Yoshimura, Kazunori; Tsuji, Kazuhiro; and Kontani, Kazuo, 4,532,485, Cl. 334-51.000.

Tsuji, Teruji; Sato, Hisao; and Hamashima, Yoshio, to Shionogi & Co., Ltd. Fluoromethylthiooxacephalosporins. 4,532,233, Cl. 514-63.000.

Tsukioka, Yasunori, to Ricoh Company, Ltd. Facsimile relaying method. 4,532,379, Cl. 179-2.00R.

Tsunoda, Kazuhiko: *See*—
Isono, Tokio; and Tsunoda, Kazuhiko, 4,531,755, Cl. 280-277.000.

Tsunoda, Yoshito; Maeda, Takeshi; Nakamura, Shigeru; and Kaku, Toshimitsu, to Hitachi, Ltd. Optical recording apparatus. 4,532,522, Cl. 346-44.000.

Tully, Wilfred R., to Roussel Uclaf. Imidazo(1,2-a)pyrimidines and their salts useful for treating anxiety. 4,532,243, Cl. 514-258.000.

Tung, Ming-Biu: *See*—
Niknejad, Jahl; and Tung, Ming-Biu, 4,531,508, Cl. 126-90.00R.

Turbo Refrigerating Company: *See*—
Hagen, William F., 4,531,380, Cl. 62-320.000.

Turbo Ventana Limited: *See*—
Palmer, George J., 4,531,455, Cl. 98-96.000.

Turk, Roger R.: *See*—
Harrington, James A.; Pastor, Antonio C.; Standlee, Arlie G.; and Turk, Roger R., 4,532,000, Cl. 156-620.000.

Turko, John W.: *See*—
Engel, Larry J.; and Turko, John W., 4,531,558, Cl. 141-44.000.

Turley, John W.; and Sendzimir, Michael G., to T. Sendzimir, Inc. Six-high rolling mills. 4,531,394, Cl. 72-238.000.

Turner, John V.; and Bell, Russell A. Process for making gibberellins. 4,532,334, Cl. 549-297.000.

Turner, Namon L. IV securing means. 4,531,942, Cl. 604-180.000.

Turner, Reed J.: *See*—
Peters, Loren W.; and Turner, Reed J., 4,531,528, Cl. 130-24.000.

Tyler, Verl A.: *See*—
Avedian, Aaron M.; and Tyler, Verl A., 4,532,030, Cl. 209-45.000.

Tyrell, John A.: *See*—
Jaquiss, Donald B. G.; McCready, Russell J.; and Tyrell, John A., 4,532,290, Cl. 524-417.000.

UBE Industries, Ltd.: *See*—
Hayashi, Junnosuke; Tanibuchi, Teruo; and Yamamoto, Shinji, 4,532,291, Cl. 524-496.000.

Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Programmable circuit including a latch to store a fuse's state. 4,532,607, Cl. 365-96.000.

Ueda, Akiyoshi; Nagasaki, Humiko; Takakura, Yutaka; and Kojima, Shigeru, to Nippon Soda Company Limited. Phenylbutyraldehydes. 4,532,363, Cl. 568-424.000.

Ueda, Fusao: *See*—
Enomoto, Hiroshi; Kawamata, Masanobu; Nomura, Akira; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,532,238, Cl. 514-245.000.

Ueda, Masahiro: *See*—
Inagaki, Takafumi; and Ueda, Masahiro, 4,531,432, Cl. 74-866.000.

Ueno, Susumu: *See*—
Endo, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Ueno, Susumu, 4,532,150, Cl. 427-39.000.

Ueno, Tsuyoshi; Suzuki, Katsumi; and Hirose, Masataka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming amorphous silicon film. 4,532,199, Cl. 430-128.000.

Uetani, Kenichi; and Umeda, Yasukazu, to Mitsubishi Denki Kabushiki Kaisha. Elevator control system. 4,531,616, Cl. 187-29.00R.

Ukigai, Toshiyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Jun-ichi; and Ukigai, Toshiyuki, 4,532,053, Cl. 252-8.55D.

Ullman, Edwin F.; and Grumet, F. Carl, to SYVA Company. Fluorescent determination of microlymphocytotoxicity. 4,532,203, Cl. 435-7.000.

Umeda, Yasukazu: *See*—
Uetani, Kenichi; and Umeda, Yasukazu, 4,531,616, Cl. 187-29.00R.

Underwood, J. Larry. Mold permitting air ejection of a flanged article. 4,531,703, Cl. 249-66.00A.

Uneyama, Kenji: *See*—
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; and Saito, Norio, 4,532,077, Cl. 260-245.400.

Ungar, Israel S.: *See*—
O'Dell, Robin D.; Ungar, Israel S.; and Scher, Herbert I., 4,532,170, Cl. 428-143.000.

Uni-Charm Corporation: *See*—
Suzuki, Migaku; Kobayashi, Toshio; Sasaki, Satoshi; and Imai, Shigeo, 4,532,173, Cl. 428-218.000.

Union Carbide Corporation: *See*—
Chiu, Herman S., 4,532,141, Cl. 426-250.000.
Dickinson, Barry L., 4,532,305, Cl. 525-390.000.
Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,532,311, Cl. 526-62.000.
Gardner, Hugh C., 4,532,296, Cl. 525-48.000.
Gardner, Hugh C., 4,532,297, Cl. 525-48.000.
Robeson, Lloyd M., 4,532,288, Cl. 524-375.000.
Spurr, Orson K., 4,532,274, Cl. 523-457.000.

Union de Brasseries: *See*—
Bonnome, Jean-Pierre, 4,532,140, Cl. 426-13.000.

Union Oil Company of California: *See*—
Delaney, Dennis D., 4,532,117, Cl. 423-226.000.
Fenton, Donald M., 4,532,044, Cl. 210-660.000.

Union Special Corporation: *See*—
Kosrow, Robert L., 4,531,721, Cl. 270-45.000.

Unique Functional Products: *See*—
Law, Denny B., 4,531,731, Cl. 272-145.000.

Uniroyal, Inc.: *See*—
Loveless, Frederick C.; and Smudin, David J., 4,532,061, Cl. 252-58.000.

United Innovations div. of United Engineers, Inc.: *See*—
Parent, Christopher A.; and Ferry, William R., 4,531,314, Cl. 40-119.000.

United Kingdom Atomic Energy Authority: *See*—
Segal, David L., 4,532,072, Cl. 252-313.100.

United States of America
Agriculture: *See*—
Powell, Richard G.; and Smith, Cecil R., Jr., 4,532,327, Cl. 546-214.000.
Army: *See*—
Ducote, Marjorie E.; and Greer, Charles L., Jr., 4,531,989, Cl. 149-19.200.
F'Geppert, Erwin, 4,531,847, Cl. 384-519.000.
Gerard, Henry M., 4,532,603, Cl. 364-819.000.
Hemmings, Davis L., 4,531,869, Cl. 410-107.000.
Romano, Salvatore A., Jr., 4,532,380, Cl. 179-2.00C.
Stover, Harris A., 4,532,625, Cl. 370-58.000.

Wysor, Michael S.; and Zwelling, Leonard A., 4,532,122, Cl. 424-10.000.

Energy: *See—*
Cawley, William E., 4,532,102, Cl. 376-185.000.
Collins, H. Dale; Busse, Lawrence J.; and Lemon, Douglas K., 4,531,411, Cl. 73-603.000.
Colmenares, Carlos A.; Somorjai, Gabor A.; and Maj, Joseph J., 4,532,230, Cl. 502-344.000.
Doll, David W., 4,532,101, Cl. 376-136.000.
Gilbert, Hubert W., 4,532,646, Cl. 378-207.000.
McHargue, Carl J., 4,532,149, Cl. 427-38.000.

Health and Human Services: *See—*
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,532,215, Cl. 435-237.000.
Ito, Yoichiro, 4,532,039, Cl. 210-198.200.

Navy: *See—*
Lucas, Michael R., 4,531,285, Cl. 29-827.000.
Wolfe, Lewis E.; and Howard, Ross K., 4,531,299, Cl. 33-366.000.

U.S. Philips Corporation: *See—*
Bout, Willem J. F., 4,532,580, Cl. 362-306.000.
Gloaguen, Gilbert Y. M., 4,532,441, Cl. 307-455.000.
Groenewegen, Willem F. M., 4,532,543, Cl. 358-86.000.
Orlowski, Reiner U.; Kobs, Rolf U. D.; and Liehr, Manfred R., 4,531,415, Cl. 73-718.000.
Shibata, Minoru; Hayashi, Koichi; and Abe, Katsumi, 4,531,287, Cl. 30-43.600.

United Technologies Corporation: *See—*
Barnes, Philip E., 4,531,448, Cl. 91-384.000.
Griffith, James B.; and Sanborn, Harold C., 4,531,270, Cl. 29-156.80B.
Jordan, Lester W.; Loersch, Joseph F.; and Adinolfi, Robert G., 4,532,403, Cl. 219-121.0ED.
MacNitt, Donald G., Jr.; Walker, Raymond M.; and Walker, Bryant H., 4,531,396, Cl. 72-354.000.
Stone, Robert A., 4,531,620, Cl. 192-45.000.

Unitek Corporation: *See—*
Boettcher, Ralph A., 4,531,566, Cl. 164-246.000.

University of California, The Regents of The: *See—*
Rubinsky, Boris, 4,531,373, Cl. 62-63.000.

University of Delaware: *See—*
Castle, John E.; and Deschamps, Jeffrey R., 4,532,321, Cl. 536-20.000.

University of Kentucky Research Foundation: *See—*
Payne, Frederick A., 4,531,462, Cl. 110-210.000.

Uno, Masaki, to Sharp Kabushiki Kaisha. Laser activating system for laser printing. 4,532,552, Cl. 358-302.000.

Uno, Shuzo: *See—*
Higuchi, Masao; Uno, Shuzo; Ishii, Yasuhisa; Makino, Kazuhiro; and Okasaka, Kenichi, 4,531,647, Cl. 212-147.000.

UOP Inc.: *See—*
Hafner, Edmund W.; and Jackson, Denise M., 4,532,208, Cl. 435-94.000.

Upjohn Company, The: *See—*
Gammill, Ronald B., 4,532,340, Cl. 549-471.000.
Wallach, Donald P., 4,531,963, Cl. 71-77.000.
White, David R., 4,532,336, Cl. 549-361.000.

Urbani, Aldo: *See—*
Rogo, Casimir; and Urbani, Aldo, 4,531,886, Cl. 415-90.000.

Ury, Michael G.: *See—*
Matthews, John C.; Ury, Michael G.; Wood, Charles H.; and Greenblatt, Marshal, 4,532,427, Cl. 250-492.200.

Uzaki, Nagato; Matui, Kazuharu; Toyoda, Shigehiro; and Hikita, Katuro, to Sintokogio Ltd. Gas hardening type molding machine. 4,531,565, Cl. 164-160.100.

Uzawa, Shunichi: *See—*
Hatanaka, Katsunori; and Uzawa, Shunichi, 4,532,536, Cl. 357-30.000.

Vacha, Lubos J. B.; and Lindborg, Ulf H., to Telefonaktiebolaget LM Ericsson. Method and apparatus for coating filamentary objects. 4,532,160, Cl. 427-434.500.

Vachiery, Edmond: *See—*
Gueussier, Andre ; and Vachiery, Edmond, 4,531,972, Cl. 75-58.000.

Valente, Raymond L., to Valente, Raymond L. Metal working apparatus. 4,531,439, Cl. 83-200.000.

Valeo: *See—*
Bacher, Michel; and Despres, Dominique, 4,531,622, Cl. 192-70.180.

Valle, Erick: *See—*
Toro, Henry D.; and Valle, Erick, 4,531,381, Cl. 62-372.000.

Valle, Franco; and Musso, Pietro, to Ing. C. Olivetti & C., S.p.A. Line spacing device for printing machines. 4,531,850, Cl. 400-551.000.

Vallourec: *See—*
Gueussier, Andre ; and Vachiery, Edmond, 4,531,972, Cl. 75-58.000.

Van Doorne's Transmissie B.V.: *See—*
Cadee, Theodorus P. M., 4,531,927, Cl. 474-72.000.

VanCise, Kenneth L., Jr., to General Motors Corporation. Rack and pinion steering gear with adjustable low friction anti-roll rack bearing. 4,531,603, Cl. 180-148.000.

Van den Berg, Christiaan, to Wopex V.O.F. Overhead viewing mirror apparatus for bedridden and paralyzed persons. 4,531,813, Cl. 350-623.000.

Vandenberg, John H.; and Mendenhall, Michael J. Cross-country ski, ski boot, and binding combination and boot and binding components thereof. 4,531,309, Cl. 36-117.000.

Van Heertum, John C.; and Herrero, Maria P., to Dow Chemical Company, The. Substituted phenylalkyl quinclidinum salts and their use as plant growth control agents. 4,531,967, Cl. 71-94.000.

Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. New surface-active statistical oligomers, a process for their preparation and compositions in which they are present. 4,532,125, Cl. 424-47.000.

van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. Process for producing 1,1-dimethyl-3-indanones, products produced thereby and organoleptic uses thereof. 4,532,357, Cl. 568-327.000.

Van Loveren, Augustinus G.: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,532,361, Cl. 568-382.000.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,532,359, Cl. 568-346.000.

Van Ouwerkerk, Anton: *See—*
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,532,359, Cl. 568-346.000.

Van Tassel, Robert A.; Rydell, Mark A.; and Schjeldahl, Gilmore T., to Angiomedics Corporation. Catheter with soft deformable tip. 4,531,943, Cl. 604-280.000.

VanVoorhees, Steven C. Machine gun adaptor. 4,531,446, Cl. 89-29.000.

Varen Technology: *See—*
Vaughan, Ronald J., 4,532,347, Cl. 562-528.000.

Varian Associates, Inc.: *See—*
Balkwill, John T., 4,532,171, Cl. 428-188.000.

Varin, Philippe: *See—*
Keinborg, Maurice; Varin, Philippe; Bertaud, Yves; and Leroy, Michel, 4,532,017, Cl. 204-67.000.

Vasquez, Andrew R. Vibration attenuator for disc brake rotor machining. 4,531,434, Cl. 82-34.00R.

Vaughan, Ronald J., to Varen Technology. Membrane solvent extraction process. 4,532,347, Cl. 562-528.000.

VDO Adolf Schindling AG: *See—*
Rau, Karl; and Haub, Martin, 4,532,491, Cl. 338-33.000.

VEB Jenapharm: *See—*
Teubner, Herbert; Kramer, Axel; Weuffen, Wolfgang; Schrotter, Eberhard; and Grubel, Gerhard, 4,532,367, Cl. 568-745.000.

VEB Leuna-Werke "Walter Ulbricht": *See—*
Fuchs, Wilfried; Richter, Horst; Kaufmann, Vendelin; Muller, Christina; Kober, Roland; and Renker, Wolfgang, 4,532,068, Cl. 252-188.280.

Vecellio, Anthony M., to General Motors Corporation. Robot painting system for automobiles. 4,532,148, Cl. 427-31.000.

Veeze, Christiaan E., to Social Werkvoorzieningschap Zuidwest-Veluwe. Device for marking out workpieces. 4,531,296, Cl. 33-189.000.

Vektronics, Inc.: *See—*
Eaton, Homer L., 4,531,992, Cl. 156-152.000.

Venture Chemicals, Inc.: *See—*
Cowan, Jack C., 4,531,594, Cl. 175-72.000.

Venturello, Carlo; and Ricci, Marco, to Montedison S.p.A. Process for the preparation of carboxylic acids starting from olefines or vicinal dihydroxy compounds. 4,532,079, Cl. 260-413.000.

Vereinigte Edelstahlwerke AG (VEW): *See—*
Kos, Bernd, 4,531,974, Cl. 75-123.00N.

Vernet, Borje, to Alfa-Laval AB. Process for manufacture of meat meal and fat from an animal raw material. 4,532,144, Cl. 426-643.000.

Victor Company of Japan, Limited: *See—*
Ishigaki, Yukinobu; and Hirohashi, Kazutoshi, 4,532,475, Cl. 328-165.000.
Matsuda, Norio; Konno, Toshio; Yamamoto, Kaneo; Tominaga, Shinya; Kubo, Susumu; Mori, Yasuyuki; Akiyama, Naoki; and Murakami, Masaki, 4,532,620, Cl. 369-136.000.
Matsumoto, Yukio, 4,532,178, Cl. 428-328.000.
Tanaka, Hideshi, 4,532,523, Cl. 346-76.0PH.

Vidar, Gronberg: *See—*
Hans, Lindqvist; and Vidar, Gronberg, 4,532,034, Cl. 210-112.000.

Vieth, Harold F., to Deere & Company. Transfer case oil pump. 4,531,421, Cl. 74-467.000.

Villasenor-Mejia, Antonio: *See—*
Lazcano-Navarro, Arturo; and Villasenor-Mejia, Antonio, 4,531,718, Cl. 266-186.000.

Villemure, Denis: *See—*
Boillot, Jean-Paul; Begin, Ghislain; Alexandrov, N.; Fihey, Jean-Luc; Di Vincenzo, A.; and Villemure, Denis, 4,532,404, Cl. 219-124.340.

Vio, Lino: *See—*
Meunier, Gilles; and Vio, Lino, 4,532,046, Cl. 210-698.000.

VIRAX: *See—*
Aubriot, Claude, 4,531,288, Cl. 30-99.000.

Vitafin N.V.: *See—*
Mensink, Kornelis A.; and Brouwer, Hendrik L., 4,532,467, Cl. 323-316.000.

Vitek Systems, Inc.: *See—*
Robinson, John M.; and Rodgers, Gregory D., 4,532,206, Cl. 435-36.000.

Vito, Raymond P.; and Boehm, H. Russell. Carton cutting knife. 4,531,286, Cl. 30-2.000.

Vogelhuber, Peter: *See—*
Madge, Werner; Vogelhuber, Peter; Stellmach, Dieter; and Hauger, Josef, 4,531,852, Cl. 400-692.000.

Voges, Wolfgang, to Claus Koenig KG. Apparatus for feeding a cut portion of adhesive strip to a device for sticking the back of a book block. 4,531,873, Cl. 412-36.000.

Voges, Wolfgang, to Claus Koenig KG. Apparatus for the adhesive binding of stacks of paper. 4,531,874, Cl. 412-37.000.

Voigt, William: *See*—
Kobiske, Michael; Voigt, William; and Sharma, Kris, 4,531,618, Cl. 188-321.110.

Volkswagenwerk Aktiengesellschaft: *See*—
Scholz, Romanus; Heidemeyer, Paulus; and Hofbauer, Peter, 4,531,605, Cl. 180-165.000.

Von Roll Hydraulik AG: *See*—
Meister, Erwin, deceased, 4,531,540, Cl. 137-492.500.

von Sivers, Rolf, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Apparatus for vibration isolation attachment of subframe or aggregate holder. 4,531,761, Cl. 280-785.000.

Vorbrueggen, Helmut: *See*—
Nickolson, Robert; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; and Haberey, Martin, 4,532,236, Cl. 514-184.000.

Voronin, Grigory I.; Suslov, Alexandr D.; Chizhikov, Jury V.; Ivanov, Sergei V.; and Voronin, Valentin G. Process and apparatus for producing nitrogen and oxygen. 4,531,371, Cl. 62-5.000.

Voronin, Valentin G.: *See*—
Voronin, Grigory I.; Suslov, Alexandr D.; Chizhikov, Jury V.; Ivanov, Sergei V.; and Voronin, Valentin G., 4,531,371, Cl. 62-5.000.

Vorwerk & Co. Interholding GmbH: *See*—
Sternberg, Kurt, 4,531,249, Cl. 15-49.00C.

Voss, Raymond G.: *See*—
Christensen, Don C.; and Voss, Raymond G., 4,532,310, Cl. 525-537.000.

Vossieck, Paul; and Deuring, Hans, to Goetze AG. Lip sealing ring in an internal combustion engine. 4,531,483, Cl. 123-188.00P.

Votrax, Inc.: *See*—
Gagnon, Richard T., 4,532,495, Cl. 340-347.0DA.

W. L. Gore & Assoc., Inc.: *See*—
Henn, Robert L., 4,532,316, Cl. 528-59.000.

W. L. Gore & Associates, Inc.: *See*—
Scantlebury, Todd V.; Ambruster, Jeanne B.; Bolton, Carl W.; Campbell, Stephen E.; and Green, La Thaggar, III, 4,531,916, Cl. 433-173.000.

W. R. Grace & Co., Cryovac Div.: *See*—
Mueller, Walter B., 4,532,189, Cl. 428-516.000.

WABCO Steuerungstechnik GmbH: *See*—
Gottling, Helmut; and Brausfeld, Walter, 4,531,548, Cl. 137-627.500.

Wacker-Chemie GmbH: *See*—
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,532,295, Cl. 524-827.000.

Wada, Fumio: *See*—
Omura, Yoshiaki; Mori, Fumio; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Aihara, Sukeji; Tamai, Yoshin; Wada, Fumio; and Ito, Kazuo, 4,532,258, Cl. 514-471.000.

Wada, Kenichi: *See*—
Shintani, Yoichi; Wada, Kenichi; Shimizu, Tsuguo; and Yamaoka, Akira, 4,532,589, Cl. 364-200.000.

Wade, James J., to Riker Laboratories, Inc. Substituted triazolo[4,3-c]pyrimidines. 4,532,242, Cl. 514-258.000.

Wagensommer, Joseph; Klein, Robert R.; and Lundberg, Robert D., to Exxon Research and Engineering Co. Process for the sulfonation of an elastomeric polymer. 4,532,302, Cl. 525-343.000.

Wahl, Hans-Jurgen: *See*—
Koch, Friedrich-Otto; and Wahl, Hans-Jurgen, 4,531,409, Cl. 73-588.000.

Wahl, Helmut: *See*—
Dorries, Peter; and Wahl, Helmut, 4,532,292, Cl. 524-598.000.

Wain-Roy, Inc.: *See*—
Arnold, Carroll H., 4,531,883, Cl. 414-722.000.

Waldman, Donald J.: *See*—
Bailey, John M.; Gibson, Dennis H.; Hackett, David E.; Stockner, Alan R.; and Waldman, Donald J., 4,531,494, Cl. 123-450.000.

Wales, R. Langdon; and Crowley, H. W. Method and apparatus for weighing waste signatures from a printing press. 4,531,599, Cl. 177-165.000.

Walker, Bryant H.: *See*—
MacNitt, Donald G., Jr.; Walker, Raymond M.; and Walker, Bryant H., 4,531,396, Cl. 72-354.000.

Walker, Joe H.: *See*—
Pair, Louis C., 4,531,438, Cl. 83-156.000.

Walker, Raymond M.: *See*—
MacNitt, Donald G., Jr.; Walker, Raymond M.; and Walker, Bryant H., 4,531,396, Cl. 72-354.000.

Wallach, Donald P., to Upjohn Company, The. Use of phenyl hydrazines for seed biostimulation or the treatment of lipoxygenase mediated seed deteriorations. 4,531,963, Cl. 71-77.000.

Wallach, Steven; Holberger, Kenneth D.; Staudaner, Steven M.; and Henry, Carl, to Data General Corporation. Data processing system having a unique address translation unit. 4,532,590, Cl. 364-200.000.

Wallach, Steven J.: *See*—
Bratt, Richard G.; Schleimer, Stephen I.; Gavrin, Edward S.; Pilat, John F.; Wallach, Steven J.; Katz, Lawrence H.; Wells, Douglas M.; Clancy, Gerald F.; Mundie, Craig J.; Bernstein, David H.; Jones, Thomas M.; and Bachman, Brett L., 4,532,586, Cl. 364-200.000.

Waller, William G., to Tektronix, Inc. True zoom of a displayed image. 4,532,605, Cl. 364-900.000.

Wallis, Frederick A. Adjustable arm. 4,531,855, Cl. 403-55.000.

Walser, Donald C., to Forintek Canada Corp. Veneer lathe chuck. 4,531,435, Cl. 82-40.00R.

Wan, Wankei: *See*—
Shuey, Harry F.; and Wan, Wankei, 4,532,041, Cl. 210-500.200.

Wandrey, Christian: *See*—
Aivasidis, Alexander; and Wandrey, Christian, 4,532,042, Cl. 210-603.000.

Wang, Chin-Chun: *See*—
Labib, Mohamed E.; Wang, Chin-Chun; and Poll, Robert F., 4,532,074, Cl. 252-511.000.

Wang, Joseph Y., to Miles Laboratories, Inc. Use of quaternary ammonium polyelectrolyte salts in test means, test device and method for determining the ionic strength or specific gravity of a liquid sample. 4,532,216, Cl. 436-2.000.

Wang, Samuel S.; and Scanlon, Michael J., to American Cyanamid Company. Froth flotation process. 4,532,031, Cl. 209-166.000.

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Werbel, Leslie M.; and Hung, Jocelyn H., 4,532,240, Cl. 514-252.000.

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Wauhop, Billy J., Jr.; and Stratz, Willard W., to Besser Company. Production of concrete articles utilizing heat-reclaiming system. 4,531,304, Cl. 34-30.000.

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Webb, Shirley B.: *See*—
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Weber, Bernhard G.; and Frey, Otto, to Sulzer Brothers Limited. Artificial hip joint socket. 4,531,243, Cl. 623-22.000.

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Wellman, Donald C.: *See—*
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Wener, Kenneth R., to Marathon Oil Company. System for and method of processing a seismic signal. 4,532,618, Cl. 367-46.000.

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Werth, Dee A., to Allied Corporation. Electrical connector assembly having means for EMI shielding. 4,531,805, Cl. 339-143.00R.

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Whatley, Gene. Truck tool box anchor assembly. 4,531,774, Cl. 296-37.600.

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White, Walton L., to Auto Logic, Inc. Film media take-up spindle with automatic engagement pawl. 4,531,685, Cl. 242-74.100.

White, William L.; and Anzeveno, Peter B., to Dow Chemical Company, The. Synthesis of 11-deoxyprostaglandins. 4,532,081, Cl. 260-464.000.

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Meese, William G.; Pratt, Robert G.; Charneski, Mitchell D.; Brokenshire, Robert E.; and Whitney, Bruce F., 4,532,418, Cl. 235-381.000.

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Wilhelm, Robert O., Jr.: Automatic water heater system. 4,531,509, Cl. 126-362.000.

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Wilkinson, Dent P., to Marconi Company Limited, The. Radio communications receivers. 4,532,636, Cl. 375-1.000.

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Lang, Stanley A., Jr.; Fields, Thomas L.; Wilkinson, Raymond G.; Kang, Soon M.; and Lin, Yang-I, 4,532,349, Cl. 564-194.000.

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Williams, Abbott R. Retractable tiller for installation at side of tractor. 4,531,589, Cl. 172-5.000.

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Williams, Marshall, to Ampex Corporation. Apparatus and method for indicating tape time. 4,532,560, Cl. 360-72.300.

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Willinger, Allan H., to Willinger Bros., Inc. Aquarium aerating device. 4,532,037, Cl. 210-169.000.

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Wilson, James D.: *See—*
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Windish, Willis E., to Caterpillar Tractor Co. Planetary transmission. 4,531,428, Cl. 74-765.000.

Wine, Charles M., to RCA Corporation. Teletext set-top converter with transparent mode. 4,532,540, Cl. 358-12.000.

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Wingler, Frank, to Bayer Aktiengesellschaft. Hydrophilized cellulose esters, process for their preparation, their use as biomedical materials and contact lenses produced from these. 4,532,277, Cl. 524-37.000.

Winters, Donald C.; and Klein, Ivan D., to Flintkote Company, The. Inorganic fiber mat using mineral wool and related process and apparatus. 4,532,006, Cl. 162-3.000.

Winther, Harry. Service tool for pressure indicating valve. 4,531,473, Cl. 116-34.00R.

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Woerner, Michael, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Folding apparatus receiving printed products from a rotary printing machine and method of redeposition. 4,531,722, Cl. 270-47.000.

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Wolfe, Lewis E.; and Howard, Ross K., to United States of America, Navy. Analog inclination data system. 4,531,299, Cl. 33-366.000.

Wolfram, Joachim W., to Ethyl Corporation. Process for preparing aryloxyalkylpyruvic acids. 4,532,345, Cl. 562-406.000.

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Wong, Stephen S.: *See*—
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Wood, Charles H.: *See*—
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Wood, James R., to World Color Press, Inc. Machine and process for stacking and bundling flexible sheet material. 4,531,343, Cl. 53-399.000.

Wood, Jonathan R., to Data General Corporation. Pulse width modulator having nonlinear transfer function. 4,532,435, Cl. 307-265.000.

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Wright, David B.; Ralston, Richard W., Jr.; and Ford, James M., to Olin Corporation. Chlor-alkali cell control system based on mass flow analysis. 4,532,018, Cl. 204-98.000.

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Wright, Hershel E. Foam dispensing device air return system. 4,531,659, Cl. 222-190.000.

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Wrinkle, Rodney P., to Fitness Products, Inc. Exercise bar. 4,531,729, Cl. 272-123.000.

Wu, Jiun-Tsong. Memory device. 4,532,608, Cl. 365-127.000.

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Yamada, Kazuo, to Togo Japan Inc. Standing position support apparatus for amusement vehicle. 4,531,459, Cl. 104-53.000.

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Yamato, Akihiro; and Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method having fail-safe function for abnormalities in engine temperature detecting means at the start of the engine. 4,531,495, Cl. 123-479.000.

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Yana, Masasumi; and Ohno, Tadayoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal ink-transfer printing apparatus. 4,532,524, Cl. 346-76.0PH.

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Nakagawa, Takeo; Noguchi, Hiroyuki; Yanagisawa, Akira; Fuma, Toyoji; Tsuchida, Masanobu; Inagaki, Takehiro; and Hayashi, Yoshikazu, 4,531,705, Cl. 249-134.000.

Yanagishima, Fumiya: *See*—
Sato, Kuniaki; Muto, Shinichiro; Yanagishima, Fumiya; and Shimoyama, Yuji, 4,531,904, Cl. 431-10.000.

Yang, James H. C.: *See*—
Tomaszewski, Walter; and Yang, James H. C., 4,531,339, Cl. 52-716.000.

Yang, Ning-Sun; and Paau, Alan, to Agracetus. Plant tissue culture device. 4,531,324, Cl. 47-81.000.

Yano, Yasuhiro: *See*—
Nishida, Haruki; and Yano, Yasuhiro, 4,532,468, Cl. 323-367.000.

Yarmush, David M.: *See*—
Springer, Charles S., Jr.; Pike, Martin M.; Balschi, James A.; Yarmush, David M.; and Chu, Simon C. K., 4,532,217, Cl. 436-79.000.

Yarnell, James A., to Dana Corporation. Transmission shift rod interlock system. 4,531,422, Cl. 74-475.000.

Yasui, Masaru; and Kato, Kazuhisa, to Stanley Electric Co., Ltd. Amorphous silicon photoreceptor with nitrogen and boron. 4,532,196, Cl. 430-31.000.

Yasui, Shinichiro: *See*—
Hatano, Itaru; Takahashi, Kenji; Hirosawa, Shigeru; Kanda, Mikio; Yasui, Shinichiro; Ichikawa, Akira; Mimori, Teruo; Sasaki, Toshio; Mukai, Tadashi; and Takahashi, Thuneo, 4,532,514, Cl. 340-995.000.

Yasumoto, Hidetosni: *See*—
Yuasa, Yoshio; Kawagoe, Nobukazu; and Yasumoto, Hidetoshi, 4,531,830, Cl. 355-56.000.

Yates, Roy A., to Pacesetter Systems, Inc. Introducer catheter apparatus and method of use. 4,531,937, Cl. 604-53.000.

Yeda Research and Development Company Ltd.: *See*—
Lavi, Sara, 4,532,220, Cl. 436-501.000.

Yen, Mei-Rong: *See*—
Yu, Terry T.; and Yen, Mei-Rong, 4,532,078, Cl. 260-396.00R.

Yhtyneet Paperitehtaat Oy: *See*—
Ahonen, Heikki, 4,532,413, Cl. 219-279.000.

Yoda, Haruo: *See*—
Shibayama, Akinori; Fujinami, Minpai; and Yoda, Haruo, 4,532,598, Cl. 364-491.000.

Yoda, Tadashi: *See*—
Moriya, Yukio; Yoda, Tadashi; and Fukumoto, Hisashi, 4,531,366, Cl. 60-421.000.

Yokogawa Hokushin Electric Corporation: *See*—
Yamaguchi, Keiki; Ogawa, Tadashi; Mitamura, Masayoshi; and Shimizu, Tooru, 4,532,644, Cl. 378-16.000.

Yokota, Masaji: *See*—
Arai, Noboru; Yokota, Masaji; and Yanagimoto, Takekazu, 4,531,829, Cl. 355-43.000.

Yokoyama, Tatsuro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,532,137, Cl. 514-371.000.

Yonekura, Kenichi; Asami, Kazuto; Hino, Yushi; and Yagi, Katsumi, to Glory Kogyo Kabushiki Kaisha. Circular object's diameter determining device. 4,531,625, Cl. 194-102.000.

Yoneyama, Takao: *See*—
Miura, Tatsuo; Ohta, Kaz::hiro; Hasegawa, Yoshiharu; and Yoneyama, Takao, 4,531,980, Cl. 148-11.50C.

Yoshida, Hideo: *See*—
Yamada, Tosimichi; and Yoshida, Hideo, 4,531,450, Cl. 92-37.000.

Yoshida Kogyo K. K.: *See*—
Gartner, Karl, 4,531,332, Cl. 52-58.000.

Yoshida Kogyo K.K.: *See*—
Gartner, Karl, 4,531,336, Cl. 52-209.000.
Gartner, Karl, 4,531,550, Cl. 138-89.000.

Yoshida, Toshio: *See*— .
Nagayasu, Kuniaki; Konno, Setsuzou; and Yoshida, Toshio, 4,531,305, Cl. 34-31.000.

Yoshimura, Kazunori: *See*—
Ito, Katsuo; Yoshimura, Kazunori; Tsuji, Kazuhiro; and Kontani, Kazuo, 4,532,485, Cl. 334-51.000.

Yoshimura, Masafumi: *See*—
Kobayashi, Toshiaki; and Yoshimura, Masafumi, 4,532,280, Cl. 524-108.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; and Ogawa, Riichi, 4,531,657, Cl. 222-108.000.

Yoshioka, Sumio: *See*—
Iwamoto, Masatami; Nakamura, Shiro; Miyazaki, Masayuki; and Yoshioka, Sumio, 4,532,445, Cl. 310-52.000.

Yoshioka, Yoshihiro: *See*—
Kimura, Toshihiro; Takasaki, Kazuhiro; Harima, Hiroshi; and Yoshioka, Yoshihiro, 4,532,298, Cl. 525-96.000.

Yu, Terry T.; and Yen, Mei-Rong, to Energy Conversion Devices, Inc. Reductant precursor for tellurium imaging compositions. 4,532,078, Cl. 260-396.00R.

Yuasa, Yoshio; Kawagoe, Nobukazu; and Yasumoto, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Automatic focusing device for an enlarger. 4,531,830, Cl. 355-56.000.

Zagranski, Raymond D.; and Howlett, James J., to Chandler Evans, Inc. Torsional mode suppressor. 4,531,361, Cl. 60-39.161.

Zajic, Albert H., to American Trailers, Incorporated. Temperature control apparatus for mounting in a transportable body. 4,531,377, Cl. 62-187.000.

Zasuwa, Gerard A., to Henry Ford Hospital. Method and apparatus for administering blood. 4,531,941, Cl. 604-113.000.

Zeck, Ted E., to Y-Z Industries, Inc. Gas sampling pump. 4,531,895, Cl. 417-401.000.

Zeiler, Frank S.: *See*—
Muse, John F.; Riddle, Harry W.; Zeiler, Frank S.; and Buruato, Juventino, 4,531,582, Cl. 166-241.000.

Zentner, Mark R.; and Cutler, Orvid R., Jr., to DeSoto, Inc. Thermally curable wet-impregnated rovings. 4,531,354, Cl. 57-250.000.

Ziemek, Gerhard; and Pahl, Ingo H., to Kabel- und Metallwerke Gutehoffnungshuette A.G. Heat-insulating tubing. 4,531,991, Cl. 156-79.000.

Zimmerly, Robert D., to Ladish Co. Snap-on valve gasket. 4,531,532, Cl. 137-15.000.

Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Cooling the liquid in an insulating container. 4,531,383, Cl. 62-457.000.

Zink, John H., to AT&T Information Systems Inc. Data call transfer. 4,532,377, Cl. 179-2.0DP.

Zinsmeyer, Thomas M., to Carrier Corporation. Purge system monitor for a refrigeration system. 4,531,375, Cl. 62-85.000.

Zopf, David. Manufacturing support and shipping package. 4,531,639, Cl. 206-523.000.

Zukowski, Raymond W., to Timex Corporation. Electroluminescent flexible touch switch panel. 4,532,395, Cl. 200-314.000.

Zwelling, Leonard A.: *See*—
Wysor, Michael S.; and Zwelling, Leonard A., 4,532,122, Cl. 424-10.000.

Zwirn, Robert, to Hughes Aircraft Company. Resolution enhancement and zoom. 4,532,548, Cl. 358-166.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JULY, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzo nv: *See—*
Buter, Roelof, Re. 31,961, Cl. 524-539.000.

Brodeur, Lester R., to Sanders Associates, Inc. LORAN-C navigation apparatus. Re. 31,962, Cl. 343-389.000.

Buter, Roelof, to Akzo nv. High solids pigment coating composition. Re. 31,961, Cl. 524-539.000.

Caterpillar Tractor Co.: *See—*
Deck, James R., Re. 31,956, Cl. 74-501.00R.

Deck, James R., to Caterpillar Tractor Co. Infinitely adjustable cable controlled apparatus and method. Re. 31,956, Cl. 74-501.00R.

Hilt, Merlyn R., to Hilt Tire Feedbunk, Inc. Apparatus for turning tires inside out. Re. 31,958, Cl. 425-383.000.

Hilt Tire Feedbunk, Inc.: *See—*
Hilt, Merlyn R., Re. 31,958, Cl. 425-383.000.

Iwata, Masakatsu: *See—*
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, Re. 31,955, Cl. 52-209.000.

Kage, Ryusuke: *See—*
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, Re. 31,955, Cl. 52-209.000.

Kelly, Calvin E.; and Stanley, Richard W., to United States Steel Corporation. Sealing means for a coke oven chuck door. Re. 31,959, Cl. 202-248.000.

Nippon Light Metal Company, Limited: *See—*
Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, Re. 31,955, Cl. 52-209.000.

Olsson, Lars F. G. Pneumatic-hydraulic tool, preferably for blind riveting. Re. 31,957, Cl. 173-169.000.

Phillips, Cecil L., to Scott Bader Company Limited. Composites and methods for providing metal clad articles and articles produced. Re. 31,960, Cl. 428-418.000.

Sanders Associates, Inc.: *See—*
Brodeur, Lester R., Re. 31,962, Cl. 343-389.000.

Scott Bader Company Limited: *See—*
Phillips, Cecil L., Re. 31,960, Cl. 428-418.000.

Shiga, Yoshinobu; Kage, Ryusuke; and Iwata, Masakatsu, to Nippon Light Metal Company, Limited. Flashing construction for a curtain wall. Re. 31,955, Cl. 52-209.000.

Stanley, Richard W.: *See—*
Kelly, Calvin E.; and Stanley, Richard W., Re. 31,959, Cl. 202-248.000.

United States Steel Corporation: *See—*
Kelly, Calvin E.; and Stanley, Richard W., Re. 31,959, Cl. 202-248.000.

LIST OF DESIGN PATENTEES

A. J. Antunes & Company: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 279,854, Cl. D7-361.000.

Aderans Company Ltd.: *See—*
Nemoto, Nobuo, 279,931, Cl. D28-93.000.

American District Telegraph Company: *See—*
Guscott, John K.; Beeson, Kenneth E.; Dyer, Hugh D.; Vulgaris, George; and Thornton, H. Patrick, 279,871, Cl. D10-106.000.
Thornton, Hugh P., Jr.; and Powers, Robert B., 279,872, Cl. D10-106.000.

American Motors Corporation: *See—*
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 279,929, Cl. D26-122.000.

American Standard Inc.: *See—*
Bateman, John L., 279,907, Cl. D19-11.000.
Niemann, James E.; and Stairs, Henry M., Jr., 279,923, Cl. D23-32.000.

Amiga Corporation: *See—*
Lee, Hugh M., 279,912, Cl. D21-48.000.

Antunes, August J.: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 279,854, Cl. D7-361.000.

Antunes, Jerome: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 279,854, Cl. D7-361.000.

APM Corporation: *See—*
Morse, Milton, 279,898, Cl. D14-66.000.

Arnau Pibet, Jose M^{a}, to Exin-Lines Bros, S.A. Toy construction piece. 279,915, 7-30-85, Cl. D21-108.000.

AT&T Teletype Corporation: *See—*
Genaro, Donald M.; Tilley, Alvin R.; McQueen, Edwin D.; Murglin, Joseph G.; Oneby, James E.; and Ramig, Robert J., Jr., 279,902, Cl. D14-111.000.

Bateman, John L., to American Standard Inc. Combined checks and check stubs. 279,907, 7-30-85, Cl. D19-11.000.

Bedgood, Douglas H., to Bedgood, Douglas H. Aquatic exercising device. 279,919, 7-30-85, Cl. D21-198.000.

Beeson, Kenneth E.: *See—*
Guscott, John K.; Beeson, Kenneth E.; Dyer, Hugh D.; Vulgaris, George; and Thornton, H. Patrick, 279,871, Cl. D10-106.000.

Bergstrom, Arne, to Swish AB. Window cleaner. 279,932, 7-30-85, Cl. D32-41.000.

Bertwood Marketing Inc.: *See—*
Brooker, John H.; and Brooker, Herbert A., 279,850, Cl. D7-3.000.

Blumer, John E.; Ehmke, Richard J.; and Linsenmeyer, Arthur F., to Dempster Industries Inc. Washdown sprayer tank. 279,921, 7-30-85, Cl. D23-2.000.

Boffo, Michael W. Digital clock. 279,868, 7-30-85, Cl. D10-6.000.

Boulanger, Edward L.: *See—*
Tantillo, James M.; and Boulanger, Edward L., 279,893, Cl. D13-24.000.

Bova, Anthony J. Telescoping fill neck for a waterbed mattress. 279,922, 7-30-85, Cl. D23-27.000.

Brockway, Reid E., to Novatech Research Corporation. Instrument face panel. 279,892, 7-30-85, Cl. D13-12.000.

Brooker, Herbert A.: *See—*
Brooker, John H.; and Brooker, Herbert A., 279,850, Cl. D7-3.000.

Brooker, John H.; and Brooker, Herbert A., to Bertwood Marketing Inc. Combined cup and coaster base. 279,850, 7-30-85, Cl. D7-3.000.

Brussing, Bernd: *See—*
Zeischegg, Walter; and Brussing, Bernd, 279,888, Cl. D11-152.000.

C. Bruno & Son, Inc.: *See—*
Ireland, Roger B., 279,906, Cl. D17-22.000.

Carbajales Santa-Eulalia, Javier B.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,889, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a tree frog. 279,889, 7-30-85, Cl. D11-158.000.

Carre, Alain, to Parfums Guy Laroche, Societe Anonyme. Combined bottle and closure. 279,863, 7-30-85, Cl. D9-336.000.

Clover Mfg. Co., Ltd.: *See—*
Gakiya, Yoshiaki, 279,835, Cl. D3-28.000.

Colgate-Palmolive Company: *See—*
Hjelle, Lars, 279,838, Cl. D4-104.000.

Colortran, Inc.: *See—*
McNabb, Ira G.; Wolfe, Denis G.; and Fischette, Robert G., 279,928, Cl. D26-63.000.

Component Manufacturing Service, Inc.: *See—*
Tantillo, James M.; and Boulanger, Edward L., 279,893, Cl. D13-24.000.

Czech, Joachim. Dispenser for flowable products. 279,866, 7-30-85, Cl. D9-366.000.

Dempster Industries Inc.: *See—*
Blumer, John E.; Ehmke, Richard J.; and Linsenmeyer, Arthur F., 279,921, Cl. D23-2.000.

Design Institute America, Inc.: *See—*
Mulhauser, George C., 279,839, Cl. D6-365.000.

Detro, David G., to Solid State Artworks, Inc. Audio responsive light display badge. 279,910, 7-30-85, Cl. D20-28.000.

Dillon, Richard R., to Honeywell Information Systems Inc. Low profile keyboard or similar article. 279,901, 7-30-85, Cl. D14-100.000.

Dolan, Patricia Y. Animal head attachemnt for planters or the like. 279,843, 7-30-85, Cl. D6-404.000.

Dolan, Patricia Y. Animal body planter or the like. 279,844, 7-30-85, Cl. D6-404.000.

Drag Specialties, Inc.: *See*—
Preisler, James M.; and Stahel, Alwin J., 279,927, Cl. D26-35.000.

Dyer, Hugh D.: *See*—
Guscott, John K.; Beeson, Kenneth E.; Dyer, Hugh D.; Vulgaris, George; and Thornton, H. Patrick, 279,871, Cl. D10-106.000.

Eberle, John J. Portable canopy for camp or picnic table. 279,833, 7-30-85, Cl. D3-5.000.

Edmondson, Andrew J.; and Edmondson, E. Bud. Adjustable patient's chair for use primarily on a hospital bed. 279,841, 7-30-85, Cl. D6-367.000.

Edmondson, E. Bud: *See*—
Edmondson, Andrew J.; and Edmondson, E. Bud, 279,841, Cl. D6-367.000.

Ehmke, Richard J.: *See*—
Blumer, John E.; Ehmke, Richard J.; and Linsenmeyer, Arthur F., 279,921, Cl. D23-2.000.

Elkerbout, Marten F., to U.S. Philips Corporation. Motor block-wall-holder unit. 279,855, 7-30-85, Cl. D7-376.000.

Elkerbout, Marten F., to U.S. Philips Corporation. Mixer for a kitchen machine. 279,856, 7-30-85, Cl. D7-379.000.

Elkerbout, Marten F., to U.S. Philips Corporation. Motor block for a kitchen machine base unit. 279,857, 7-30-85, Cl. D7-386.000.

Eriksson, Albert S. Deposit rack. 279,934, 7-30-85, Cl. D99-34.000.

Esslinger, Hartmut H., to Konig & Neurath Kommanditgesellschaft. Worktable unit or similar article. 279,846, 7-30-85, Cl. D6-483.000.

Exin-Lines Bros, S.A.: *See*—
Arnau Pibet, Jose Mª, 279,915, Cl. D21-108.000.

Falzett, Douglas. Umbrella runner. 279,834, 7-30-85, Cl. D3-10.000.

Faust, Harold E. Grill hook. 279,859, 7-30-85, Cl. D8-14.000.

Firestone Tire & Rubber Company, The: *See*—
German, John D.; and Sladky, Donald J., 279,891, Cl. D12-146.000.

Fischette, Robert G.: *See*—
McNabb, Ira G.; Wolfe, Denis G.; and Fischette, Robert G., 279,928, Cl. D26-63.000.

Fukuda, Harumi: *See*—
Kosako, Mikio; Nishibori, Hiroshi; and Fukuda, Harumi, 279,903, Cl. D16-31.000.

Gaines, Mark, to Southwire Company. Conform scraper tool. 279,933, 7-30-85, Cl. D32-46.000.

Gakiya, Yoshiaki, to Clover Mfg. Co., Ltd. Elastic cap for knitting needles. 279,835, 7-30-85, Cl. D3-28.000.

Gardinier, Gene K.; and Roberts, Alan T. Body for a sled-like sports vehicle. 279,920, 7-30-85, Cl. D21-227.000.

Genaro, Donald M.; Tilley, Alvin R.; McQueen, Edwin D.; Murglin, Joseph G.; Oneby, James E.; and Ramig, Robert J., Jr., to AT&T Teletype Corporation. Printer cabinet. 279,902, 7-30-85, Cl. D14-111.000.

George, Jimmy, to Phillips Corporation, The. Vibrating shaver. 279,930, 7-30-85, Cl. D28-49.000.

German, John D.; and Sladky, Donald J., to Firestone Tire & Rubber Company, The. Tire. 279,891, 7-30-85, Cl. D12-146.000.

Guichard, Gary D.: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 279,929, Cl. D26-122.000.

Guillon, Jacques S. Seat. 279,840, 7-30-85, Cl. D6-334.000.

Guscott, John K.; Beeson, Kenneth E.; Dyer, Hugh D.; Vulgaris, George; and Thornton, H. Patrick, to American District Telegraph Company. Infrared intrusion detector system housing. 279,871, 7-30-85, Cl. D10-106.000.

Hamilton, Bert, Jr. Barbecue grill. 279,853, 7-30-85, Cl. D7-334.000.

Hanover, Kenneth P., to McMorris & Associates, Inc. Tray module for use with computer hardware. 279,847, 7-30-85, Cl. D6-510.000.

Haro Designs Inc.: *See*—
Haro, Robert B., 279,832, Cl. D2-377.000.

Haro, Robert B., to Haro Designs Inc. Strip arrangement for gloves. 279,832, 7-30-85, Cl. D2-377.000.

Hensel, Anne, to Joseph Love, Inc. Dress. 279,831, 7-30-85, Cl. D2-49.000.

Hill, Robert W. Sit-up exercise device. 279,917, 7-30-85, Cl. D21-191.000.

Hjelle, Lars, to Colgate-Palmolive Company. Toothbrush. 279,838, 7-30-85, Cl. D4-104.000.

Holliman, Deloris J. Tray for holding video game controllers. 279,845, 7-30-85, Cl. D6-406.000.

Honeywell Information Systems Inc.: *See*—
Dillon, Richard R., 279,901, Cl. D14-100.000.

Hoshino, Kiyoshi: *See*—
Sato, Yoshiyuki; and Hoshino, Kiyoshi, 279,862, Cl. D8-61.000.

Hoskins, Nathan D. Top opener. 279,861, 7-30-85, Cl. D8-39.000.

Huston, Henry H. Visual orientation device for pedestrians. 279,909, 7-30-85, Cl. D20-10.000.

Inaba, Hiroshi, to Nippon Tsushin Kogyo Kabushiki Kaisha. Telephone handset. 279,896, 7-30-85, Cl. D14-63.000.

Ireland, Roger B., to C. Bruno & Son, Inc. Drum lug. 279,906, 7-30-85, Cl. D17-22.000.

Janssens, Wilhelmus Gerardus E., to U.S. Philips Corporation. Mixer stand. 279,858, 7-30-85, Cl. D7-412.000.

John J. Madison Company, Inc.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,889, Cl. D11-158.000.

Joseph Love, Inc.: *See*—
Hensel, Anne, 279,831, Cl. D2-49.000.

Kabushiki Kaisha Matsushiro: *See*—
Matsushiro, Yukimitsu, 279,913, Cl. D21-80.000.

Kenitz, Jack E.: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 279,929, Cl. D26-122.000.

Konig & Neurath Kommanditgesellschaft: *See*—
Esslinger, Hartmut H., 279,846, Cl. D6-483.000.

Kosako, Mikio; Nishibori, Hiroshi; and Fukuda, Harumi, to Sharp Corporation. Electronic copying machine. 279,903, 7-30-85, Cl. D16-31.000.

Krispinsky, George M.: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 279,929, Cl. D26-122.000.

Kusiak, Anna Y. Cover for bedside commode. 279,848, 7-30-85, Cl. D6-610.000.

Kusiak, Anna Y. Cover for bedside commode. 279,849, 7-30-85, Cl. D6-610.000.

Kusube, Haruo, to Sumitomo Rubber Industries, Ltd. Vehicle tire. 279,890, 7-30-85, Cl. D12-146.000.

Lee, Hugh M., to Amiga Corporation. Hand operated control unit for video games. 279,912, 7-30-85, Cl. D21-48.000.

Linsenmeyer, Arthur F.: *See*—
Blumer, John E.; Ehmke, Richard J.; and Linsenmeyer, Arthur F., 279,921, Cl. D23-2.000.

Marcolin SPA: *See*—
Pulie, Luciano, 279,904, Cl. D16-102.000.

Marg, Joseph, to Stay-Tite Products. Glazing compound dispensing spout. 279,867, 7-30-85, Cl. D9-442.000.

Marshall, Eric J., to Marshall Telephone Corporation Limited, The. Telephone. 279,894, 7-30-85, Cl. D14-53.000.

Marshall Telephone Corporation Limited, The: *See*—
Marshall, Eric J., 279,894, Cl. D14-53.000.

Matsushiro, Yukimitsu, to Kabushiki Kaisha Matsushiro. Toy motorcycle. 279,913, 7-30-85, Cl. D21-80.000.

McKee, Helen R. Communion pack. 279,865, 7-30-85, Cl. D9-347.000.

McMorris & Associates, Inc.: *See*—
Hanover, Kenneth P., 279,847, Cl. D6-510.000.

McNabb, Ira G.; Wolfe, Denis G.; and Fischette, Robert G., to Colortran, Inc. Fresnel spotlight. 279,928, 7-30-85, Cl. D26-63.000.

McQueen, Edwin D.: *See*—
Genaro, Donald M.; Tilley, Alvin R.; McQueen, Edwin D.; Murglin, Joseph G.; Oneby, James E.; and Ramig, Robert J., Jr., 279,902, Cl. D14-111.000.

Menei, Laurent J., to Thomson-CSF Telephone. Telephone. 279,895, 7-30-85, Cl. D14-53.000.

Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, to A. J. Antunes & Company. Food steamer. 279,854, 7-30-85, Cl. D7-361.000.

Moon, Richard D. Earring or the like. 279,874, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,875, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,876, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,877, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,878, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,879, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,880, 7-30-85, Cl. D11-43.000.

Moon, Richard D. Earring or the like. 279,881, 7-30-85, Cl. D11-45.000.

Moon, Richard D. Earring or the like. 279,882, 7-30-85, Cl. D11-45.000.

Moon, Richard D. Earring or the like. 279,883, 7-30-85, Cl. D11-45.000.

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170 G 4,532,384

CLASS 180

6.48 4,531,601
143 4,531,602
148 4,531,603
152 4,531,604
165 4,531,605
210 4,531,606
282 4,531,607

CLASS 181

172 4,531,608
290 4,531,609

CLASS 182

5 4,531,610
44 4,531,611
196 4,531,612
206 4,531,613

CLASS 187

8.5 4,531,614
9 E 4,531,615
29 R 4,531,616
89 4,531,617

CLASS 188

321.11 4,531,618
371 4,531,619

CLASS 191

23 A 4,532,385

CLASS 192

0.094 4,531,624
45 4,531,620
58 B 4,531,621
70.18 4,531,622
82 R 4,531,623

CLASS 194

102 4,531,625

CLASS 198

347 4,531,626
420 4,531,627
432 4,531,628
458 4,531,629
505 4,531,630
853 4,531,631

CLASS 200

11 R 4,532,387
11 TC 4,532,386
61.43 4,532,388
83 B 4,532,390
83 P 4,532,389
144 B 4,532,391
147 R 4,532,392
159 R 4,532,393
275 4,532,394
314 4,532,395

CLASS 202

248 Re.31,959
4,532,010

CLASS 203

9 4,532,011
53 4,532,012

CLASS 204

1 T 4,532,013
28 4,532,014
38.3 4,532,016
38.4 4,532,015
67 4,532,017
98 4,532,018
129.46 4,532,019
158 HA 4,532,020
159.16 4,532,021
192 D 4,532,022
402 4,532,023

CLASS 205

113 4,532,025

CLASS 206

14 4,531,632
230 4,531,633
391 4,531,634
457 4,531,635
461 4,531,636
4,531,637
486 4,531,638
523 4,531,639

CLASS 208

11 LE 4,532,024
164 4,532,026
255 4,532,027
262 4,532,028
308 4,532,029

CLASS 209

45 4,532,030
166 4,532,031
4,532,032
4,532,033

CLASS 210

112 4,532,034
150 4,532,035
167 4,532,036
169 4,532,037
194 4,532,038
198.2 4,532,039
222 4,532,040
500.2 4,532,041
603 4,532,042
635 4,532,043
660 4,532,044
668 4,532,045
698 4,532,046
4,532,047
701 4,532,048
728 4,532,049

CLASS 211

41 4,531,640
4,531,641
42 4,531,642
64 4,531,643
70.5 4,531,644
131 4,531,645
150 4,531,646

CLASS 212

147 4,531,647

CLASS 213

50 4,531,648

CLASS 215

232 4,531,649
256 4,531,650
354 4,531,651

CLASS 219

10.49 R 4,532,396
10.55 E 4,532,397
10.79 4,532,398
117.1 4,532,399
121 ED 4,532,403
121 LH 4,532,401
121 LS 4,532,400
121 LU 4,532,402
124.34 4,532,404
4,532,405
4,532,406
125.1 4,532,407
130.01 4,532,408
137 R 4,532,409
211 4,532,410
245 4,532,411
271 4,532,412
279 4,532,413
308 4,532,414

CLASS 220

83 4,531,652
85 S 4,531,653

CLASS 222

78 4,531,654
105 4,531,655
108 4,531,657
131 4,531,656
181 4,531,658
190 4,531,659
209 4,531,660

CLASS 224

191 4,531,661

CLASS 226

159 4,531,662

CLASS 228

29 4,531,663
125 4,531,664
170 4,531,665
171 4,531,666

CLASS 229

1.5 R 4,531,667
43 4,531,668
45 R 4,531,669
4,531,670

CLASS 235

131 R 4,532,415
379 4,532,416
4,532,417
381 4,532,418
492 4,532,419

CLASS 237

12.3 B 4,531,671

CLASS 239

89 4,531,672
113 4,531,673
230 4,531,674
290 4,531,675
453 4,531,676
520 4,531,677
533.3 4,531,678
585 4,531,679
676 4,531,680

CLASS 241

146 4,531,681

CLASS 242

54 R 4,531,682
68.3 4,531,683
71.1 4,531,684
74.1 4,531,685
96 4,531,686
107.3 4,531,688
107.4 A 4,531,687
195 4,531,689
197 4,531,690

CLASS 244

1 A 4,531,691
17.19 4,531,692
52 4,531,693
54 4,531,694
119 4,531,695

CLASS 248

37.3 4,531,696
221.2 4,531,697
243 4,531,698
550 4,531,699
672 4,531,700
676 4,531,701

CLASS 249

64 4,531,702
66 A 4,531,703
67 4,531,704
134 4,531,705

CLASS 250

201 4,532,420
223 R 4,532,421
306 4,532,422
310 4,532,423
338 4,532,424
363 S 4,532,425
442.1 4,532,426
492.2 4,532,427
507.1 4,532,428
559 4,532,429
572 4,532,430

CLASS 251

25 4,531,706
44 4,531,707
48 4,531,708
4,531,709
167 4,531,710
214 4,531,711

CLASS 252

8.55 D 4,532,051
4,532,053
8.55 R 4,532,052
8.6 4,532,050
12.4 4,532,054
28 4,532,055
49.6 4,532,056
49.8 4,532,057
51.5 A 4,532,058
52 R 4,532,059
55 4,532,060
58 4,532,061
78.1 4,532,062
90 4,532,063
105 4,532,064
135 4,532,065
144 4,532,066
174.17 4,532,067
188.28 4,532,068
299.1 4,532,069
301.4 H 4,532,070
4,532,071
313.1 4,532,072
492 4,532,073
511 4,532,074
514 4,532,075
557 4,532,076

CLASS 254

21 4,531,716
88 4,531,712
131.5 4,531,713
134.3 R 4,531,714
266 4,531,715

CLASS 260

245.4 4,532,077
396 R 4,532,078
413 4,532,079
464 4,532,081
465.1 4,532,082
465.3 4,532,083
978 4,532,084
990 4,532,085

CLASS 261

94 4,532,086
114 JP 4,532,087
142 4,532,088

CLASS 264

4.3 4,532,089
14 4,532,090
29.5 4,532,091
30 4,532,092
40.1 4,532,093
53 4,532,094
107 4,532,095
109 4,532,096
258 4,532,097
320 4,532,098
510 4,532,099
564 4,532,100

CLASS 266

166 4,531,717
186 4,531,718

CLASS 267

57.1 R 4,531,719

CLASS 269

71 4,531,720

CLASS 270

45 4,531,721
47 4,531,722

CLASS 271

14 4,531,723
166 4,531,724
186 4,531,725
263 4,531,726

CLASS 272

117 4,531,727
122 4,531,728
123 4,531,729
144 4,531,730
145 4,531,731

CLASS 273

14 4,531,732
25 4,531,733
29 A 4,531,734
54 B 4,531,735
56 4,531,736
65 R 4,531,737
73 C 4,531,738
127 C 4,531,739
148 B 4,531,740
157 R 4,531,741
176 F 4,531,742
183 B 4,531,743
275 4,531,744
336 4,531,745

CLASS 277

53 4,531,746
134 4,531,747
153 4,531,748
188 A 4,531,749
235 B 4,531,750

CLASS 280

1.11 R 4,531,751
47.18 4,531,752
80 B 4,531,753
261 4,531,754
277 4,531,755
279 4,531,756
461 A 4,531,757
628 4,531,758
668 4,531,759
777 4,531,760
785 4,531,761
801 4,531,762
810 4,531,763

CLASS 281

29 4,531,764

CLASS 283

114 4,531,765

CLASS 285

18 4,531,766
220 4,531,767
338 4,531,768

CLASS 290

4 R 4,532,431

CLASS 292

113 4,531,769
307 R 4,531,770

CLASS 294

104 4,531,771
115 4,531,772

CLASS 296

26 4,531,773
37.6 4,531,774
100 4,531,775
190 4,531,776
223 4,531,777

CLASS 297

85 4,531,778
284 4,531,779

CLASS 298

17.6 4,531,780
22 P 4,531,781

CLASS 299

1 4,531,782
2 4,531,783
64 4,531,784

CLASS 301

5.7 4,531,785
37 PB 4,531,786

CLASS 305

12 4,531,787

CLASS 307

10 R 4,532,432
241 4,532,433
261 4,532,434
265 4,532,435
279 4,532,436
358 4,532,437
362 4,532,438
450 4,532,439
455 4,532,440
4,532,441
520 4,532,442
575 4,532,443

CLASS 308

6 C 4,531,788

CLASS 310

41 4,532,444
52 4,532,445
87 4,532,446
114 4,532,447
163 4,532,448
198 4,532,449
329 4,532,450
353 4,532,451

CLASS 312

268 4,531,789

CLASS 313

346 R 4,532,452
391 4,532,453
506 4,532,454
579 4,532,455

CLASS 315

223 4,532,456
411 4,532,457

CLASS 318

111 4,532,458
138 4,532,459
139 4,532,460
254 4,532,461
372 4,532,462
616 4,532,463
807 4,532,464
814 4,532,465

CLASS 323

311 4,532,466
316 4,532,467
367 4,532,468

CLASS 324

61 R 4,532,469
76 R 4,532,470
110 4,532,471
122 4,532,472
306 4,532,473
309 4,532,474

CLASS 328

165 4,532,475

CLASS 330

123 4,532,476
149 4,532,477
151 4,532,478
261 4,532,479
286 4,532,480
288 4,532,481
307 4,532,482

CLASS 333

34 4,532,483
116 4,532,484

CLASS 334

51 4,532,485

CLASS 335

13 4,532,486
128 4,532,487

CLASS 337

111 4,532,488
228 4,532,489
320 4,532,490

CLASS 338

33 4,532,491
34 4,532,492

CLASS 339

14 R 4,531,790
4,531,791
17 CF 4,531,792
17 F 4,531,793
39 4,531,794
45 M 4,531,795
60 M 4,531,796
61 M 4,531,797
75 M 4,531,798
4,531,799
75 P 4,531,800
89 M 4,531,801
90 R 4,531,802
97 R 4,531,803
4,531,804
143 R 4,531,805
147 R 4,531,806
223 S 4,531,807
258 S 4,531,808

CLASS 340

58 4,532,493
347 AD 4,532,494
347 DA 4,532,495
4,532,496
365 S 4,532,497
545 4,532,498
644 4,532,499
675 4,532,500
679 4,532,501
717 4,532,502
728 4,532,503
739 4,532,504
775 4,532,505
784 4,532,506
825 4,532,509
825.31 4,532,507
825.34 4,532,508
870.39 4,532,510
933 4,532,511
950 4,532,512
971 4,532,513
995 4,532,514

CLASS 343

16 R 4,532,515

17.7 4,532,516
372 4,532,517
4,532,518
4,532,519
373 4,532,520
389 Re.31,962

CLASS 346

33 R 4,532,521
44 4,532,522
76 PH 4,532,523
4,532,524
4,532,525
107 R 4,532,526
108 4,532,527
135.1 4,532,528
136 4,532,529
140 R 4,532,530
153.1 4,532,531

CLASS 350

96.19 4,531,809
96.20 4,531,810
96.33 4,531,811
128 4,531,812
355 4,531,814
475 4,531,815
521 4,531,816
556 4,531,817
623 4,531,813

CLASS 354

83 4,531,818
92 4,531,819
234.1 4,531,820
320 4,531,821
401 4,531,822

CLASS 355

3 DD 4,531,832
3 FU 4,531,824
3 R 4,531,823
3 SH 4,531,828
3 TR 4,531,825
14 CU 4,531,826
14 R 4,531,827
43 4,531,829
56 4,531,830
57 4,531,831

CLASS 356

5 4,531,833
73 4,531,834
124 4,531,835
316 4,531,836
376 4,531,837
382 4,531,838

CLASS 357

15 4,532,532
16 4,532,533
23.4 4,532,534
23.5 4,532,535
30 4,532,536
4,532,537
70 4,532,538
81 4,532,539

CLASS 358

12 4,532,540
21 R 4,532,541
31 4,532,542
86 4,532,543
87 4,532,544
100 4,532,545
111 4,532,546
148 4,532,547
166 4,532,548
213 4,532,549
4,532,550
228 4,532,553
257 4,532,554
293 4,532,551
302 4,532,552
310 4,532,555

CLASS 360

19.1 4,532,556
33.1 4,532,557
35.1 4,532,558
51 4,532,559
72.3 4,532,560
73 4,532,561
78 4,532,562
96.5 4,532,563
97 4,532,564
106 4,532,565
132 4,532,566

CLASS 361

31 4,532,567
42 4,532,568
76 4,532,569
93 4,532,570
4,532,571
306 4,532,572
307 4,532,573
365 4,532,574
413 4,532,575
415 4,532,576

CLASS 362

80 4,532,577
83 4,532,578
239 4,532,579
306 4,532,580

CLASS 363

39 4,532,581
90 4,532,582
96 4,532,583

CLASS 364

140 4,532,584
4,532,586
4,532,587
4,532,588
4,532,589
4,532,590
414 4,532,591
431.05 4,532,592
431.11 4,532,593
4,532,594
463 4,532,595
469 4,532,596
471 4,532,597
491 4,532,598
552 4,532,599
565 4,532,600
571 4,532,601
577 4,532,602
819 4,532,603
851 4,532,604
900 4,532,605

CLASS 365

49 4,532,606
96 4,532,607
127 4,532,608
130 4,532,610
154 4,532,609
200 4,532,611
227 4,532,612
230 4,532,613

CLASS 366

110 4,531,839
142 4,531,840

CLASS 367

19 4,532,617
46 4,532,618
81 4,532,614
87 4,532,615

CLASS 368

63 4,531,841

CLASS 369

44 4,532,616
106 4,532,619
111 4,532,621
136 4,532,620
271 4,532,622
4,532,623

CLASS 370

13 4,532,624
58 4,532,625
85 4,532,626
4,532,627

CLASS 371

13 4,532,628
38 4,532,629
68 4,532,630

CLASS 372

48 4,532,631
50 4,532,632

CLASS 373

72 4,532,633
93 4,532,634

CLASS 374

1 4,531,842
40 4,531,843
208 4,531,844

CLASS 375

1 4,532,635
4,532,636
10 4,532,637
17 4,532,638
96 4,532,639
120 4,532,640

CLASS 376

136 4,532,101
185 4,532,102
245 4,532,103
272 4,532,104

CLASS 377

14 4,532,641
15 4,532,642
45 4,532,643

CLASS 378

16 4,532,644
147 4,532,645
207 4,532,646

CLASS 381

22 4,532,647
41 4,532,648
69 4,532,649

CLASS 382

8 4,532,650
54 4,532,651

CLASS 383

103 4,532,652

CLASS 384

406 4,531,845
478 4,531,846
519 4,531,847

CLASS 400

124 4,531,848
229 4,531,849
551 4,531,850
583.3 4,531,851
692 4,531,852

CLASS 401

265 4,531,853

CLASS 402

27 4,531,854

CLASS 403

55 4,531,855
366 4,531,856

CLASS 404

44 4,531,857
48 4,531,858
73 4,531,859

CLASS 405

60 4,531,860
261 4,531,861

CLASS 406

155 4,531,862

CLASS 407

113 4,531,863
114 4,531,864

CLASS 408

139 4,531,865
158 4,531,866
224 4,531,867

CLASS 409

269 4,531,868

CLASS 410

107 4,531,869

CLASS 411

108 4,531,870
361 4,531,871
433 4,531,872

CLASS 412

36 4,531,873
37 4,531,874

CLASS 414

22 4,531,875
325 4,531,876
372 4,531,877
412 4,531,878
462 4,531,879
473 4,531,880
572 4,531,881
687 4,531,882
722 4,531,883
729 4,531,884
735 4,531,885

CLASS 415

90 4,531,886
4,531,887
148 4,531,888

CLASS 416

96 R 4,531,889
187 4,531,890

CLASS 417

59 4,531,891
205 4,531,892
220 4,531,893
312 4,531,894
401 4,531,895
456 4,531,896
500 4,531,897

CLASS 418

26 4,531,898
59 4,531,899
61 A 4,531,900

CLASS 420

451 4,532,105
528 4,532,106

CLASS 422

56 4,532,107
143 4,532,108
240 4,532,109
245 4,532,110

CLASS 423

22 4,532,111
87 4,532,112
138 4,532,113
210 4,532,114
4,532,115
226 4,532,116
4,532,117
4,532,118
230 4,532,119
347 4,532,120
600 4,532,121

CLASS 424

10 4,532,122
21 4,532,123
47 4,532,125
48 4,532,126
52 4,532,124
62 4,532,127
78 4,532,128
94 4,532,129
101 4,532,130
162 4,532,131

CLASS 425

150 4,531,901
383 Re.31,958
408 4,531,902
429 4,531,903

CLASS 426

13 4,532,140
250 4,532,141
388 4,532,142
577 4,532,143
580 4,532,146
643 4,532,144
650 4,532,145
655 4,532,147

CLASS 427

31 4,532,148
38 4,532,149
39 4,532,150
54.1 4,532,151
96 4,532,152
131 4,532,153
175 4,532,154
213 4,532,155
220 4,532,156
262 4,532,157
355 4,532,158
388.4 4,532,159
434.5 4,532,160
440 4,532,161

CLASS 428

31 4,532,162
36 4,532,163
4,532,164
4,532,165
57 4,532,166
78 4,532,167
99 4,532,168
109 4,532,169
143 4,532,170
188 4,532,171
212 4,532,172
215 4,532,174
218 4,532,173
220 4,532,175
288 4,532,176
328 4,532,177
4,532,178
335 4,532,179
336 4,532,180
4,532,181
367 4,532,182
402.22 4,532,183
418 Re.31,960
433 4,532,184
447 4,532,185
457 4,532,186
4,532,187
500 4,532,188
516 4,532,189
627 4,532,190
678 4,532,191

CLASS 429

19 4,532,192
82 4,532,193
99 4,532,194
213 4,532,195

CLASS 430

31 4,532,196
41 4,532,197
84 4,532,198
128 4,532,199
138 4,532,200
202 4,532,201
552 4,532,202

CLASS 431

10 4,531,904
12 4,531,905
146 4,531,906
170 4,531,907
215 4,531,908

CLASS 432

37 4,531,909
120 4,531,910

CLASS 433

8 4,531,911
80 4,531,912
4,531,913
136 4,531,914
173 4,531,915
4,531,916
176 4,531,917

CLASS 434

118 4,531,918
262 4,531,919

CLASS 435

7 4,532,203
29 4,532,204
30 4,532,205
36 4,532,206
68 4,532,207
94 4,532,208
156 4,532,209
168 4,532,210
172.3 4,532,211
197 4,532,212
225 4,532,213
228 4,532,214
237 4,532,215

CLASS 436

2 4,532,216
79 4,532,217
82 4,532,218
155 4,532,219
501 4,532,220

CLASS 440

47 4,531,920
53 4,531,921

CLASS 441

74 4,531,922

CLASS 446

66 4,531,323
138 4,531,923
213 4,531,924
369 4,531,925

CLASS 474

49 4,531,926
72 4,531,927
93 4,531,928

CLASS 493

55 4,531,929
108 4,531,930
317 4,531,931

CLASS 501

22 4,532,221
32 4,532,222
4,532,223
105 4,532,224

CLASS 502

62 4,532,225
71 4,532,226
180 4,532,227
261 4,532,228
330 4,532,229
344 4,532,230
347 4,532,231
403 4,532,232

CLASS 514

55 4,532,134
63 4,532,233
4,532,234
144 4,532,235
184 4,532,236
222 4,532,135
226 4,532,237
245 4,532,238
247 4,532,239
252 4,532,240
258 4,532,241
4,532,242
4,532,243
275 4,532,245
4,532,246
277 4,532,136
291 4,532,244
299 4,532,247
302 4,532,248
324 4,532,249
341 4,532,250
354 4,532,251
357 4,532,252
369 4,532,138
371 4,532,137
374 4,532,253
456 4,532,254
466 4,532,255
469 4,532,256
470 4,532,257
471 4,532,258
543 4,532,343
608 4,532,259
627 4,532,139
725 4,532,133
772 4,532,132

CLASS 521

84.1 4,532,260
103 4,532,261
127 4,532,262
133 4,532,263
146 4,532,264
147 4,532,265
159 4,532,266

CLASS 523

106 4,532,267
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75	4,532,323	490	4,532,333		CLASS 560	438	4,532,352	479	4,532,365	49	4,531,936
106	4,532,324		CLASS 549	38	4,532,342	442	4,532,353	615	4,532,366	53	4,531,937
	CLASS 546	297	4,532,334	252	4,532,344	498	4,532,354	745	4,532,367	62	4,531,938
2	4,532,325	335	4,532,335		CLASS 562		CLASS 568	791	4,532,368	73	4,531,939
156	4,532,326	361	4,532,336	406	4,532,345	9	4,532,355		CLASS 585	111	4,531,940
214	4,532,327	425	4,532,337	471	4,532,346	315	4,532,356	428	4,532,369	113	4,531,941
302	4,532,328	455	4,532,338	528	4,532,347	327	4,532,357	512	4,532,370	180	4,531,942
342	4,532,329	470	4,532,339		CLASS 564	341	4,532,358		CLASS 604	280	4,531,943
	CLASS 548	471	4,532,340	27	4,532,348	346	4,532,359	6	4,531,932	302	4,531,944
311	4,532,330	559	4,532,341	194	4,532,349	357	4,532,360	8	4,531,933	378	4,531,945
342	4,532,331		CLASS 556	412	4,532,350	382	4,532,361	22	4,531,934		CLASS 623
473	4,532,332	139	4,532,080	415	4,532,351	401	4,532,362	45	4,531,935	8	4,531,244
						424	4,532,363			22	4,531,243
						444	4,532,364				

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D2—	28	279,830		610	279,848		366	279,866			279,884		100	279,901		194	279,918
	49	279,831			279,849		442	279,867			279,885		111	279,902		198	279,919
	377	279,832	D7—	3	279,850	D10—	6	279,868		121	279,886	D16—	31	279,903		227	279,920
D3—	5	279,833		37	279,851		53	279,869		130.1	279,887		102	279,904	D23—	2	279,921
	10	279,834		105	279,852		62	279,870		152	279,888	D17—	13	279,905		27	279,922
	28	279,835		334	279,853		106	279,871		158	279,889		22	279,906		32	279,923
	40	279,836		361	279,854			279,872	D12—	146	279,890	D19—	11	279,907		51	279,924
		279,837		376	279,855		116	279,873			279,891	D20—	4	279,908	D24—	53	279,925
D4—	104	279,838		379	279,856	D11—	43	279,874	D13—	12	279,892		10	279,909		68	279,926
D6—	334	279,840		386	279,857			279,875		24	279,893		28	279,910	D26—	35	279,927
	365	279,839		412	279,858			279,876	D14—	53	279,894	D21—	5	279,911		63	279,928
	367	279,841	D8—	14	279,859			279,877			279,895		48	279,912		122	279,929
	370	279,842			279,860			279,878		59	279,897		80	279,913	D28—	49	279,930
	404	279,843		39	279,861			279,879		63	279,896		89	279,914		93	279,931
		279,844		61	279,862			279,880		66	279,898		108	279,915	D32—	41	279,932
	406	279,845	D9—	336	279,863		45	279,881		68	279,899		136	279,916		46	279,933
	483	279,846		341	279,864			279,882		73	279,900		191	279,917	D99—	34	279,934
	510	279,847		347	279,865			279,883									

CLASSIFICATION OF PLANTS

P.—	7	5,522	9	5,523	51	5,524	70	5,525		5,526	

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49 : 4,531,309
4,531,461
4,531,514
4,531,644
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4,531,776
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50 : 4,531,327
51 : 4,531,268
4,531,328
4,531,437
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4,532,637
4,532,642
53 : 4,531,295
4,531,338
4,531,397
4,531,411
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4,531,632
4,531,648
4,531,694
4,531,696
4,531,717
4,532,102
4,532,267
4,532,470
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54 : 4,531,481
55 : 4,531,248
4,531,324
4,531,345
4,531,351
4,531,365
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4,531,574
4,531,578
4,531,604
4,531,757
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4,532,471
4,532,473
4,532,531
4,532,574
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DESIGN PATENTS

06	279,832	279,880		279,928		279,930	32	279,865		279,887
	279,833	279,881	08	279,926	24	279,907	34	279,839		279,918
	279,834	279,882	09	279,906	25	279,871		279,898	42	279,848
	279,851	279,883	12	279,900		279,872		279,902		279,849
	279,852	279,884	13	279,933		279,893		279,911		279,886
	279,860	279,885	17	279,854		279,901	36	279,831	44	279,914
	279,864	279,910		279,899	26	279,929		279,842	47	279,841
	279,874	279,912		279,905	27	279,843		279,897		279,847
	279,875	279,919		279,917		279,844		279,908		279,861
	279,876	279,920	18	279,859		279,870	39	279,867	48	279,845
	279,877	279,922		279,868		279,927		279,891	50	279,909
	279,878	279,924	21	279,923	29	279,830	40	279,853	53	279,892
	279,879	279,925	22	279,873	31	279,921				

PLANT PATENTS

06	5,522	5,523	34	5,524			

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